PROCEEDINGS

OF THE

FOURTH SESSION

OF THE

INTERCOLONIAL
MEDICAL CONGRESS
OF AUSTRALASIA.

DUNEDIN, NEW ZEALAND, FEBRUARY, 1896.

22102120441

Med
K20086

INTERCOLONIAL MEDICAL CONGRESS
OF AUSTRALASIA.

TRANSACTIONS

OF THE

FOURTH SESSION,

HELD IN

DUNEDIN, NEW ZEALAND,

FEBRUARY, 1896.

Published under the direction of the Literary Committee.

Dunedin:
THE OTAGO DAILY TIMES AND WITNESS NEWSPAPERS COMPANY, LIMITED.
MDCCCXCVII.

BU... S, WELLCOME & CO.
LIBRARY
No. 611.
K.4.

16441 011

WELLCOME INSTITUTE
LIBRARY
Coll. welMOmec
Call
No. WM

INTERCOLONIAL MEDICAL CONGRESS OF AUSTRALASIA.

FOURTH SESSION, 1896.

Patrons:

His Excellency the Right Honourable the Earl of Glasgow, G.C.M.G., &c., Governor of New Zealand.

His Excellency the Right Honourable Viscount Hampden, G.C.M.G., &c., Governor of New South Wales.

His Excellency the Right Honourable Lord Brassey, G.C.M.G., &c., Governor of Victoria.

His Excellency the Right Honourable Sir Fowell Buxton, Bart., Governor of South Australia.

His Excellency the Right Honourable Viscount Gormanston, K.C.M.G., &c., Governor of Tasmania.

His Excellency Sir Gerard Smith, K.C.M.G., &c., Governor of Western Australia.

His Excellency Sir William MacGregor, K.C.M.G., M.D., &c., Administrator of British New Guinea.

Sir James Hector, K.C.M.G., M.D., F.R.S., &c., Chancellor of the New Zealand University.

His Honour Mr. Justice Williams, M.A., LL.M., &c., Chancellor of the University of Otago.

With the special countenance and support of Her Majesty's Ministers in New Zealand.

President:

FERDINAND CAMPION BATCHELOR, M.D. DURH., M.R.C.S. ENG., Dunedin.

Retiring President:

PHILIP SYDNEY JONES, M.D. LOND., F.R.C.S. ENG., Sydney.

Past Presidents:

JOSEPH COOKE VERCO, M.D. LOND., F.R.C.S. ENG., Adelaide, South Australia.
THOMAS NAUGHTON FITZGERALD, F.R.C.S. IREL., Melbourne, Victoria.

Vice-Presidents:

GEORGE ROTHWELL WILSON ADAM, M.B., C.M. EDIN. (President of the Medical Society of Victoria), Melbourne.

JOSEPH AHEARNE, L.R.C.S. IREL., L.R.C.P. LOND., Townsville.

HARRY BROOKES ALLEN, M.D., B.S. MELB. (Professor of Anatomy, Melbourne University), Melbourne.

EUGENE ANDERSON, M.D., B.S. MELB. (President of the Melbourne Medical Association), Melbourne.

RICHARD STONEHEWER BRIGHT, M.R.C.S. ENG., L.S.A. LOND., Hobart.

JOHN MORGAN LLOYD DAVIES, M.R.C.S. ENG., L.R.C.P. LOND. (President of the Otago Branch of the New Zealand Medical Association), Dunedin.

FRANCIS JOHN DRAKE, M.B., B.S. MELB., Launceston.

WALTER FELL, M.A., M.D. OXON, L.R.C.P. LOND., M.R.C.S. ENG. (President of the Wellington Branch of the New Zealand Medical Association), Wellington.

THOMAS NAUGHTON FITZGERALD, F.R.C.S. IREL. (former President of the Congress), Melbourne.

WILLIAM GARDNER, M.D., C.M. GLAS., Melbourne.

WILLIAM HENRY GOODE, M.A., M.D., C.M. DUB. (Chairman of the Medical Section of the Royal Society of New South Wales), Sydney.

WILLIAM PANTON GRIGOR, L.R.C.S. EDIN. (President of the Southland Branch of the New Zealand Medical Association), Invercargill

THOMAS KINLEY HAMILTON, B.A., M.D. DUB., F.R.C.S. IREL. (President of the South Australian Branch of the British Medical Association), Adelaide.

JAMES HILL, M.D. EDIN., F.R.C.S. EDIN. (President of the Medical Society of Queensland), Brisbane.

EDWIN HINCHCLIFF, M.D. EDIN., M.R.C.S. ENG., Sandhurst.

JAMES HUDSON, M.B. LOND., M.R.C.S. ENG. (President of the Nelson Branch of the New Zealand Medical Association), Nelson.

ERNEST SANDFORD JACKSON, M.B., B.S. MELB. (President of the Queensland Branch of the British Medical Association), Brisbane.

EDWARD JOHNSTONE JENKINS, M.A., M.D. LOND., M.R.C.P. LOND., M.R.C.S. ENG. (President of the New South Wales Branch of the British Medical Association), Sydney.

Edward Jennings, M.R.C.S. Eng., L.R.C.P. Lond., (President of the Canterbury Branch of the New Zealand Medical Association), Christchurch.

Philip Sydney Jones, M.D. Lond., F.R.C.S. Eng. (former President of the Congress), Sydney.

Samuel Thomas Knaggs, M.D., C.M. Aberd., F.R.C.S. Irel., Sydney.

George Lane Mullins, M.A., M.D. Dub., L.K.Q.C.P. Irel. (President of the Eastern Suburbs Medical Association), Sydney.

Philip Edward Muskett, L.R.C.S., L.R.C.P. Edin., Sydney.

Wilfred John Robert Nickson, M.D., Ch.B. Irel. (President of the Newcastle Medical Society), Newcastle, N.S.W.

Robert Denham Pinnock, M.D., B.S. Melb., Ballarat.

Benjamin Poulton, M.D., B.S. Melb., M.R.C.S. Eng., Adelaide.

Frederick Harrison Quaife, M.D., C.M. Glas. (President of the Medical Union of New South Wales), Sydney.

William Snowball, M.B., B.S. Melb., L.R.C.S. Edin. (President of the Victorian Branch of the British Medical Association), Melbourne.

Gregory Sprott, M.D., C.M. Glas., Hobart.

Edward Charles Stirling, M.A., M.D. Cantab., F.R.C.S. Eng., F.R.S., Adelaide.

Thomas Peter Anderson Stuart, M.D., C.M. Edin. (Professor of Anatomy, Sydney University), Sydney.

Harry Swift, M.D. Cantab., M.R.C.S. Eng. (President of the Associated Practitioners of South Australia), Adelaide.

George Adlington Syme, M.B., M.S. Melb., F.R.C.S. Eng., Melbourne.

Joseph Crabb Verco, M.D., B.S. Lond., L.R.C.P. Lond., F.R.C.S. Eng. (former President of the Congress), Adelaide.

Henry Walker, L.F.P.S. Glas. (President of the Auckland Branch of the New Medical Association), Auckland.

John Edgar Wolfhagen, M.B., C.M. Edin., Hobart.

Percy Moore Wood, L.R.C.P. Lond., M.R.C.S. Eng. (President of the Western Suburbs Medical Association), Sydney.

Local Secretaries:

New South Wales ...	Philip Edward Muskett, L.R.C.S., L.R.C.P. Edin., Sydney.
Victoria	George Adlington Syme, M.B., M.S. Melb., F.R.C.S. Eng., Melbourne.
South Australia ...	Benjamin Poulton, M.D., B.S. Melb., M.R.C.S. Eng., Adelaide.
Queensland ...	Ernest Sandford Jackson, M.B., B.S. Melb., Brisbane.
Western Australia ...	Henry Frederick Harvey, M.R.C.S. Eng., Perth.
Tasmania	Gregory Sprott, M.D., C.M. Glas., Hobart.

General Treasurer:

Joseph Osborne Closs, M.D., C.M. Edin., George Street, Dunedin, New Zealand.

General Secretaries:

John Halliday Scott, M.D., C.M. Edin., M.R.C.S. Eng., University, Dunedin, New Zealand.

Louis Edward Barnett, M.B., C.M. Edin., F.R.C.S. Eng., Stafford Street, Dunedin, New Zealand.

General Committee:

Edward William Alexander, M.R.C.S. Eng., L.R.C.P. Lond., Dunedin, New Zealand.

Charles Morton Anderson, M.R.C.S. Eng., Christchurch, New Zealand.

George Edward Anson, M.D., M.C. Cantab., M.R.C.S. Eng., Wellington, New Zealand.

Louis Edward Barnett, M.B. Edin., F.R.C.S. Eng., Dunedin, New Zealand.

Ferdinand Campion Batchelor, M.D. Dub., M.R.C.S. Eng., Dunedin, New Zealand.

William Brown, M.A. Aberd., M.B., C.M. Edin., Dunedin, New Zealand.

Thomas Cahill, M.D., C.M., Q.U. Irel., Wellington, New Zealand.

George Cleghorn, M.D. Durh., M.R.C.S. Eng., Blenheim, New Zealand.

Joseph Osborne Closs, M.D., C.M. Edin., Dunedin, New Zealand.

William Edward Collins, M.B. Lond., M.R.C.S. Eng., Wellington, New Zealand.

Daniel Colquhoun, M.D. Lond., M.R.C.P. Eng., Dunedin, New Zealand.

George Henry Cressy, M.R.C.S. Eng., L.R.C.P. Lond., Nelson, New Zealand.

John Cunningham, M.B., C.M. Edin., Port Chalmers, New Zealand.

John Morgan Lloyd Davies, M.R.C.S. Eng., L.R.C.P. Lond., Dunedin, New Zealand.

Walter Fell, M.D. Oxon., L.R.C.P. Lond., M.R.C.S. Eng., Wellington, New Zealand.

Alexander John Fergusson, M.D., St. And., L.F.P.S., Glas., Dunedin, New Zealand.

Henry Lindo Ferguson, M.D. Dub., F.R.C.S. Irel., Dunedin, New Zealand.

Robert Valpy Fulton, M.B., C.M. Edin., Dunedin, New Zealand.

Albert Isaac Garland, M.R.C.S. Eng., L.R.C.P. Lond., Oamaru, New Zealand.

William Panton Grigor, L.R.C.S. Edin., Invercargill, New Zealand.

Charles Henry Haines, M.D., C.M., Q.U. Irel., Auckland, New Zealand.

Thomas Morland Hocken, M.R.C.S. Eng., Dunedin, New Zealand.

Richard Bowen Hogg, M.R.C.S. Eng., Timaru, New Zealand.

James Hudson, M.D. Lond., M.R.C.S. Eng., Nelson, New Zealand.

James Irving, M.D., Edin., M.R.C.S. Eng., Christchurch, New Zealand.

David Philip James, F.R.C.S. Eng., L.R.C.P. Lond., Wellington, New Zealand.

Frederick Howorth Jeffcoat, M.B., C.M. Edin., Dunedin, New Zealand.

Edward Jennings, M.R.C.S. Eng., L.R.C.P. Lond., Christchurch, New Zealand.

Frederick William John Robert King, M.R.C.S. Eng., L.R.C.P. Lond., Auckland, New Zealand.

Thomas Hope Lewis, M.R.C.S. Eng., L.S.A. Lond., Auckland, New Zealand.

Harry Archibald de Lautour, M.R.C.S. Eng., Oamaru, New Zealand.
Frederick Irving de Lisle, L.R.C.P. Edin., L.S.A. Lond., Napier, New Zealand.
Francis Wallace Mackenzie, M.B., C.M. Edin., Wellington, New Zealand.
Roderick Alexander McLeod, M.B., C.M. Glas., Invercargill, New Zealand.
James Macpherson, M.B., C.M. Edin., Dunedin, New Zealand.
Leslie Samuel Manning, M.B., C.M. Aber., Christchurch, New Zealand.
Albert Martin, M.D. Lond., M.R.C.S. Eng., M.R.C.P. Lond., Wellington, New Zealand.
Robert Martin, L.R.C.P. Edin., L.F.P.S. Glas., Dunedin, New Zealand.
Thomas Charles Moore, M.D., C.M. Dub., Napier, New Zealand.
John Henry Murray-Aynsley, M.R.C.S. Eng., L.R.C.P. Lond., Eketahuna, New Zealand.
Francis Ogston, M.D., C.M. Aberd., Dunedin, New Zealand.
James Cecil Palmer, M.B., C.M. Edin., F.R.C.S. Edin., Christchurch, New Zealand.
Henry Pollen, M.B., C.M. Dub., Wellington, New Zealand.
Henry Horsford Prins, M.R.C.S. Eng., Christchurch, New Zealand.
Arthur Challinor Purchas, M.B., C.M. Edin., M.R.C.S. Eng., Auckland, New Zealand.
Ernest Roberton, M.D., C.M. Edin., M.R.C.S. Eng., Auckland, New Zealand.
William Stewart Roberts, M.R.C.S. Eng., Dunedin, New Zealand.
John Halliday Scott, M.D., C.M. Edin., M.R.C.S. Eng., Dunedin, New Zealand.
William Martin Smith, M.B , M.C. Cantab., Dunedin, New Zealand.
Montague Lomax Smith, M.R.C.S. Eng., L.R.C.P. Edin., Christchurch, New Zealand.
William McStravick Stenhouse, M.D., C.M. Glas., Dunedin, New Zealand.
William Henry Symes, M.D., C.M. Edin., Christchurch, New Zealand.
Walter Thomas, M.B., C.M. Glas., Christchurch, New Zealand.
Charles Ernest Thomas, M.R.C.S. Eng., Timaru, New Zealand.
Henry Walker, L.F.P.S., Glas., Auckland, New Zealand.
James Whitton, M.D., L.R.C.S., Oamaru, New Zealand.
Thomas Bain Whitton, M.D., Q.U. Irel., L.R.C.S. Edin., Reefton, New Zealand.
James Young, M.D., C.M., Q.U. Irel., Invercargill, New Zealand.

Executive Committee :

Edward William Alexander, M.R.C.S., L.R.C.P.
Louis Edward Barnett, M.B., F.R.C.S.
Ferdinand Campion Batchelor, M.D., M.R.C.S.
William Brown, M.B., C.M.
Joseph Osborne Closs, M.D., C.M.
Daniel Colquhoun, M.D., M.R.C.P.
John Cunningham, M.B., C.M.
John Morgan Lloyd Davies, M.R.C.S., L.R.C.P.
Henry Lindo Ferguson, M.D., F.R.C.S.I.
Alexander John Fergusson, M.D.
Robert Valpy Fulton, M.B., C.M.

Thomas Morland Hocken, M.R.C.S.
Frederick Howorth Jeffcoat, M.B., C.M.
James Macpherson, M.B., C.M.
Robert Martin, L.R.C.P., L.F.P.S.G.
Francis Ogston, M.D., C.M.
William Stewart Roberts, M.R.C.S.
John Halliday Scott, M.D., M.R.C.S.
William Martin Smith, M.B., B.S.
William McStravick Stenhouse, M.D., C.M.

Reception Committee:

The President.
Daniel Colquhoun, M.D., M.R.C.P.
Thomas Morland Hocken, M.R.C.S.
William Stewart Roberts, M.R.C.S.
The General Secretaries.

Entertainment Committee:

The President.
William Brown, M.B., C.M.
John Morgan Lloyd Davies, M.R.C.S., L.R.C.P.
Henry Lindo Ferguson, M.D., F.R.C.S.I.
William Martin Smith, M.B., M.C.
The General Secretaries.

Literary Committee:

The President.
William Brown, M.B., C.M.
Daniel Colquhoun, M.D., M.R.C.P.
Henry Lindo Ferguson, M.D., F.R.C.S.I.
Thomas Morland Hocken, M.R.C.S.
Francis Ogston, M.D., C.M.
William Stewart Roberts, M.R.C.S.
The General Secretaries.

Auditor:

George Aufrere Fenwick.

Roll of Members of Congress.

Adam, G. Rothwell, M.B., C.M. Edin., Melbourne, Victoria.

Ahearne, J., L.R.C.S. Irel., L.R.C.P. Lond., Townsville, Queensland.

Aitchison, A. S., M.B., B.S. Melb., Melbourne, Victoria.

Alexander, E. H., M.B., C.M. Edin., M.R.C.S. Eng., L.R.C.P. Lond., Blenheim, New Zealand.

Alexander, E. W., M.R.C.S. Eng., L.R.C.P. Lond., Dunedin, New Zealand.

Alexander, W. C., M.B., C.M. Aberd., Wellington, New Zealand.

Allan, W., M.B., C.M. Edin., Mosgiel, New Zealand.

Allen, H. B., M.D., B.S. Melb., Melbourne, Victoria.

Anderson, C. M., M.R.C.S. Eng., L.S.A. Lond., Christchurch, New Zealand.

Anderson, E., M.D., B.S. Melb., L.R.C.P. and S. Edin., Melbourne, Victoria.

Anderson, J. F., L.R.C.P. and S. Edin., Longford, Tasmania.

Anderson, R. W., M.R.C.S. Eng., L.R.C.P. Lond., L.S.A., Lond., Christchurch, New Zealand.

Anson, G. E., M.D., M.C. Cantab., M.R.C.S. Eng., L.R.C.P. Lond., Wellington, New Zealand.

Armstrong, H., F.R.C.S. Eng., L.R.C.P. Lond., Hobart, Tasmania.

Ashworth, J., M.B., C.M., Brisbane, Queensland.

Barkas, W. J., L.R.C.P. Lond , M.R.C.S. Eng., Sydney, New South Wales

Bancroft, J., M.D. St. And., M.R.C.S. Eng., L.S.A. Lond., Brisbane, Queensland.

Barnett, L. E., M.B., C.M. Edin., F.R.C.S. Eng., L.R.C.P. Lond., Dunedin, New Zealand.

Barrett, J. W., M.D., B.S. Melb., F.R.C.S. Eng., Melbourne, Victoria

Batchelor, F. C., M.D. Durh., M.R.C.S. Eng., L.R.C.P. Edin., Dunedin, New Zealand.

Bernau, H. F., M.R.C.S. Eng., L.R.C.P. Lond., Napier, New Zealand.

Bernstein, L., M.D. Heidelberg, Lismore, New South Wales.

Bewes, E. A., M.R.C.S. Eng., L.R.C.P. Edin., Otahuhu, New Zealand.

Blackwood, F. M., M.B. Durh., M.R.C.S. Eng., L.S.A. Lond., Sydney, New South Wales.

Boor, L., M.R.C.S. Eng., L.S.A. Lond., Nelson, New Zealand.

Bowe, F., M.B. Lond., M.R.C.S. Eng., Timaru, New Zealand.

Boyd, J., M.D. St. And., L.F.P.S. Glas., L.S.A. Lond., Bendigo, Victoria.

Boyd, W. R., M.D., B.S. Melb., M.R.C.S. Eng., L.S.A. Lond., Melbourne, Victoria.

Brady, A. J., L.R.C.S. Irel., L.K.Q.C.P. Irel., Sydney, New South Wales.

Brett, J. T., M.R.C.S. Eng., L.R.C.P. Lond., Melbourne, Victoria.

Bright, R. S., M.R.C.S. Eng., L.S.A. Lond., Hobart, Tasmania.

Brown, W., M.A. Aberd., M.B., C.M. Edin., Dunedin, New Zealand.

Browne, D. Grahame, B.A., M.D., C.M. Q.U. Irel., Charters Towers, Queensland.

Burkitt, W. A. H., M.B., C.M. Dub., Goulburn, New South Wales.
Burns, T., L.R.C.P. and S. Edin., L.F.P.S. Glas., Dunedin, New Zealand.
Butement, W., M.B., Ch.B. N.Z., M.R.C.S. Eng., L.R.C.P. Lond., Masterton, New Zealand.
Cahill, T., M.D., C.M., Q.U. Irel., Wellington, New Zealand.
Campbell, C. G., M.B., C.M. Edin., Christchurch, New Zealand.
Cattan, W. J., M.B., C.M. Edin., Outram, New Zealand.
Champ, J. H., M.D. Lond., M.R.C.S. Eng., L.S.A. Lond., Beaconsfield, Tasmania.
Chapple, W. A., M.B., Ch.B. N.Z., Wellington, N.Z.
Cherry, T., M.D., B.S. Melb., Melbourne, Victoria.
Chisholm, E., M.D. St. And., M.R.C.S. Eng., L.S.A. Lond., Burradoo, New South Wales.
Chisholm, W., M.D. Lond., M.R.C.S. Eng., Sydney, New South Wales.
Christie, W. W., M.D., C.M. Glas., New Plymouth, New Zealand.
Church, R., M.B., Ch.B. N.Z., Naseby, New Zealand.
Cleghorn, G., M.D. Durh., M.R.C.S. Eng., L.S.A. Lond., Blenheim, New Zealand.
Cleland, W. L., M.B., C.M. Edin., Adelaide, South Australia.
Closs, J. O., M.D., C.M. Edin., Dunedin, New Zealand.
Collins, W. E., M.B. Lond., M.R.C.S. Eng., Wellington, New Zealand.
Colquhoun, D., M.D. Lond., M.R.C.P. Lond., M.R.C.S. Eng., Dunedin, New Zealand.
Connolly, P., L.K.Q.C.P. Irel., L.R.C.S. Irel., Wanganui, New Zealand.
Connor, S., M.D., Ch.B., Q.U. Irel., Coleraine, Victoria.
Cook, P. R., M.B., Ch.B. N.Z., Waimate, New Zealand.
Cooke, J., M.D. Roy. U. Irel., L.R.C.S. Edin., Lincoln, New Zealand.
Copland, G. A., M.B., Ch. B., N.Z., M.R.C.S. Eng., L.R.C.P. Lond., Gore, New Zealand.
Copland, J., M.D., C.M. Aberd., Gore, New Zealand.
Coutie, W. H., M.B., B.S. Melb., Sydney, New South Wales.
Crago, W. H., M.R.C.S. Eng., L.R.C.P. Lond., Sydney, New South Wales
Creed, The Hon. J. M., M.L.C., M.R.C.S. Eng., L.R.C.P. Lond., Sydney, New South Wales.
Cressy, G. H., M.R.C.S. Eng., L.R.C.P. Lond., Nelson, New Zealand.
Crowther, A. Bingham, M.R.C.S. Eng., L.R.C.P. Lond., Hobart, Tasmania.
Cunninghame, J., M.B., C.M. Edin., Port Chalmers, New Zealand.
Davies, J. M. L., M.R.C.S. Eng., L.S.A. Lond., L.R.C.P. Edin., Dunedin, New Zealand.
Dawson, F. W. E., M.R.C.S. Eng., L.R.C.P. Edin., L.S.A. Lond., Auckland, New Zealand.
De Lautour, H. A., M.R.C.S. Eng., Oamaru, New Zealand.
De Lisle, F. J., L.R.C.P. Edin., L.S.A. London, Napier, New Zealand.
Deravin, H. A., M.B., B.S. Melb., Pyramid Hill, Victoria.
Dick, J. A., M.D., C.M. Edin., Sydney, New South Wales.
Dixon, H., F.R.C.S. Edin., L.R.C.P. Edin., Brisbane, Queensland.
Donaldson, J. B., L.R.C.P. and S. Edin., L.F.P.S. Glas., Linton, Victoria.
Douglas, J., L.F.P.S. Glas., Frankton, New Zealand.
Downie, J., L.F.P.S. Glas., Ulverstone, Tasmania.

Drake, F. J., M.B., B.S. Melb., Launceston, Tasmania.

Dyring, C. P. W., M.B. Melb., Coburg, Victoria.

Earle, R. C., M.R.C.S. Eng., L.S.A. Lond., Wanganui, New Zealand.

Erson, W. R. Close, L.F.P.S. Glas., L.S.A., Lond., Onehunga, New Zealand.

Ewart, J., M.D., C.M. Edin., Wellington, New Zealand.

Faithfull, R.L., M.D. New York, L.R.C.P. Lond., L.S.A. Lond., Sydney, New South Wales.

Faulkner, J., M.R.C.S. Eng., L.R.C.P. Lond., Hastings, New Zealand.

Fell, W., M.A., M.D. Oxon., M.R.C.S. Eng., L.R.C.P. Lond., Wellington, New Zealand.

Ferguson, H. Lindo, M.A., M.D. Dub., F.R.C.S. Irel., L.K.Q.C.P. Irel., Dunedin, New Zealand.

Fergusson, A. J., M.D. St. And., L.F.P.S. Glas., Dunedin, New Zealand.

Fiaschi, T., M.D., Ch.M. Pisa., Sydney, New South Wales.

Finlay, W., M.D. San Francisco, L.F.P.S. Glas., L.R.C.P. and S. Edin., Sydney, New South Wales.

Fitzgerald, J., M.B., C.M. Edin., Kaitangata, New Zealand.

Fitzgerald, T. N., F.R.C.S. Irel., Melbourne, Victoria.

FitzHenry, G. W., M.R.C.S. Eng., L.S.A. Lond., Amberley, New Zealand.

Fooks, E. E., M.B., Ch.B. N.Z., Auckland, New Zealand.

Fullarton, J. A., M.B., C.M. Edin., Invercargill, New Zealand.

Fulton, R. V., M.B., C.M. Edin., Dunedin, New Zealand.

Garde, H. C., F.R.C.S. Edin., L.R.C.P. Edin., Maryborough, Queensland.

Gardner, W., M.D., C.M., Glas., Melbourne, Victoria.

Garland, A. J., M.R.C.S. Eng., L.R.C.P. Edin., Oamaru New Zealand.

Gibbs, S. A., M.B., C.M. Edin., Nelson, New Zealand.

Gibson, J. Lockhart, M.D., C.M. Edin., M.R.C.S. Eng., Brisbane, Queensland.

Giles, W. Anstey, M.B., C.M. Edin., Adelaide, South Australia.

Gillon, G. G., M.D., C.M. Glas., F.R.C.S. Edin., Sydney, New South Wales.

Goode, W. H., M.A., M.D., C.M. Dub., Sydney, New South Wales.

Grace, The Hon. M. S., M.L.C., M.D. Jena., L.R.C.S. Edin., Wellington, New Zealand.

Grant, D., M.A., M.D., C.M. Edin., Melbourne, Victoria.

Gregg, J. L., M.B., Ch. B. N.Z., Dunedin, New Zealand.

Grigor, W. P., L.R.C.S. Edin., Invercargill, New Zealand.

Guthrie, T. O., M.D., C.M. Glas., Lyttelton, New Zealand.

Haines, C. H., M.D., C.M. Q.U. Irel., Auckland, New Zealand.

Haines, H. G., F.R.C.S. Edin., L.R.C.P. Edin., Strahan, Tasmania.

Hamilton, T. K., B.A., M.D. Dub., F.R.C.S. Irel., Adelaide, South Australia.

Hardie, D., M.D., C.M. Aberd., Brisbane, Queensland.

Harding, H. W. L., M.R.C.S. Eng., L.R.C.P. Lond., Wellington, New Zealand.

Hare, F. E., M.D. Durh., M.R.C.S. Eng., Charters Towers, Queensland.

Harkin, C. F., B.A., M.B., Ch. B. Dub., Chiltern, Victoria.

Harrison, W. A., M.B., C.M. B. Sc. Edin., Mount Lyell, Tasmania.

Harvey, W. A., M.B. Lond., M.R.C.S. Eng., L.R.C.P. Lond., Hobart, Tasmania.

Hayes, J. S., M.D. Q.U. Irel., L.R.C.S. Irel., Temuka, New Zealand.

Hayward, W. T., M.R.C.S. Eng., L.K.Q.C.P. Irel., Adelaide, South Australia.

Hector, Sir J., K.C.M.G., F.R.S., M.D. Edin., Wellington, New Zealand.
Heeley, J. T., L.R.C.P. Edin., L.S.A. Lond., Young, New South Wales.
Hendry, A., M.B., Ch.B. N.Z., Mataura, New Zealand.
Hill, J., M.D. Edin., F.R.C.S. Edin., Brisbane, Queensland.
Hinchcliff, E., M.D. Edin., M.R.C.S. Eng., Bendigo, Victoria.
Hirschfeld, E., M.D. Stras., Brisbane, Queensland.
Hislop, W., M.B., Ch.B. N.Z., Petone, New Zealand.
Hoeken, T. M., M.R.C.S. Eng., L.S.A. Lond., Dunedin, New Zealand.
Hodges, G., M.B., C.M. Edin., Alexandra, New Zealand.
Hogg, R. B., M.R.C.S. Eng., L.S.A. Lond., Timaru, New Zealand.
Hogg, R. H., M.B., Ch.B. N.Z., M.R.C.S. Eng., L.R.C.P. Lond., Invercargill, New Zealand.
Holmes, L. S., L.R.C.P. and S. Edin., L.F.P.S. Glas., Launceston, Tasmania.
Hood, A. J., M.B., C.M. Glas., Sydney, New South Wales.
Hooper, J. W. D., L.R.C.P. and S. Edin., Melbourne, Victoria
Hope, T. C., M.B., C.M. Glas., Geelong, Victoria.
Hosking, W. H., M.R.C.S. Eng., L.S.A. Lond., Masterton, New Zealand.
Howard, G. T., B.A., M.D., B.S. Melb., Melbourne, Victoria.
Hudson, J., M.B. Lond., M.R.C.S. Eng., L.S.A. Lond., Nelson, New Zealand.
Hughes, W. Kent, M.B. Lond., M.R.C.S. Eng., Melbourne, Victoria.
Hunt, J. S., M.R.C.S. Eng., Hughenden, Queensland.
Hunter, J., M.D., C.M. Roy. U. Irel., Invercargill, New Zealand.
Huxtable, R. B., M.B., C.M. Edin., Charters Towers, Queensland.
Hyde, J. G., M.B. Toronto, L.R.C.P. and S. Edin., Clyde, New Zealand.
Innes, C. B., M.B. Lond., M.R.C.S., Eng., Wanganui, New Zealand.
Irving, T., M.D. Edin., M.R.C.S. Eng., L.S.A. Lond., Christchurch, New Zealand.
Jackson, J., M.D. Lond., M.R C.S. Eng., Melbourne, Victoria.
Jackson, E. Sandford, M.B., B.S. Melb., Brisbane, Queensland.
James, D. P., F.R.C.S. Eng., L.R.C.P. Lond., Wellington, New Zealand.
Jamieson, J., M.D., C.M. Glas., Melbourne, Victoria.
Jamieson, S. C., M.B., B.S. Melb., Hobart, Tasmania.
Jeffcoat, F. H., B.A. N.Z., M.B., C.M. Edin., Dunedin, New Zealand.
Jenkins, E. J., M.A., M.B. Oxon., M.R.C.S. Eng., M.R.C.P. Lond., L.S.A. Lond., Sydney, New South Wales.
Jennings, E., M.R.C.S. Eng., L.R.C.P. Lond., Christchurch, New Zealand.
Johnson, J. G., M.R.C.S. Eng., L.R.C.P. Lond., L.S.A. Lond., Evandale, Tasmania.
Jones, P. Sydney, M.D. Lond., F.R.C.S. Eng., Sydney, New South Wales.
Joyce, C., M.B., B.S. Melb., Lefroy, Tasmania.
Kenny, A. L., M.B., B.S. Melb., Melbourne, Victoria.
King, F. W. R. J., M.R.C.S. Eng., L.R.C.P. Lond., Auckland, New Zealand.
King, F. Truby, M.B., C.M., B Sc. Edin., Seacliff, New Zealand.
Knaggs, S. T., M.D., C.M. Aberd., F.R.C.S. Irel., L.K.Q.C.P. Irel., Sydney, New South Wales.
Knight, A. O., M.R.C.S. Eng., L.S.A. Lond., Auckland, New Zealand,
Kortum, H. A. F. B., M.D., Ch. M. Berlin, Cooktown, Queensland.

Leatham, H. B., M.R.C.S. Eng., L.R.C.P. Edin., L.S.A. Lond., New Plymouth, New Zealand.

Lendon, A. A., M.D. Lond., M.R.C.S. Eng., L.S.A. Lond., Adelaide, South Australia.

Lewis, T. H., M.R.C.S. Eng., L.S.A. Lond., Auckland, New Zealand.

Lindsay, P. A., M.B., C.M. Edin., Auckland, New Zealand.

Long, W. J., M.B., B.S. Melb., Bendigo, Victoria.

Love, W. W. R., M.B., C.M. Edin., Brisbane, Queensland.

Lovegrove, T. H., M.R.C.S. Eng., Perth, West Australia.

Low, C., M.B., C.M. Edin., Invercargill, New Zealand.

Ludlow, V. E., L.R.C.S. Irel., L.K.Q.C.P. Irel., Newcastle, New South Wales.

Macandrew, H., M.B., C.M. Edin., Hokitika, New Zealand.

McCall, J., M.B., C.M. Glas., Ulverstone, Tasmania.

McCaw, H., M.B., C.M. Glas., Mosgiel, New Zealand.

MacCormick, A., M.D., C.M. Edin., M.R.C.S. Eng., Sydney, New South Wales.

Macdonald, R. Gordon, L.R.C.P. Edin., L.F.P.S. Glas., Dunedin, New Zealand.

McDonnell, E. P., L.R.C.S. Irel., L.K.Q.C.P. Irel., Forbes, New South Wales.

McDouall, H. C., M.R.C.S. Eng., L.R.C.P. Lond., Gladesville, New South Wales.

McFarlane, W. H., M.B., B.S. Melb., New Norfolk, Tasmania.

Macgowan, E. T., M.B., B.S. Melb., Hobart, Tasmania.

MacGregor, D., M.A. Aberd., M.B., C.M. Edin., Wellington, New Zealand.

McKellar, T. G., M.B., C.M. Edin., Dunedin, New Zealand.

Mackenzie, F. W., M.B., C.M. Edin., Wellington, New Zealand.

Mackin, P., M.D. Brus., F.R.C.S. Edin., L.R.C.P. and S. Edin., L.F.P.S. Glas., L.S.A. Lond., Wellington, New Zealand.

McLeod, D. T., M.B., C.M. Glas., M.R.C.S. Eng., Nairne, South Australia.

Macleod, R. A., M.B., C.M. Glas., Invercargill, New Zealand.

McMurray, W., M.D., C.M. Q.U. Irel., Sydney, New South Wales.

Macpherson, J., M.B., C.M. Edin., Dunedin, New Zealand.

Maddox, W. G., M.R.C.S. Eng., L.R.C.P. Lond., Launceston, Tasmania.

Manning, F. N., M.D. St. And., M.R.C.S. Eng., L.S.A. Lond., Sydney, New South Wales.

Manning, L. S., M.B., C.M. Aber., Christchurch, New Zealand.

Marks, The Hon. C. F., M.L.C., M.D., Q.U. Irel., M.R.C.S. Eng., Brisbane, Queensland.

Martin, A., M.D. Lond., M.R.C.S. Eng., M.R.C.P. Lond., Wellington, New Zealand.

Martin, J. W., M.D., C.M. Edin., L.R.C.P. and S. Edin., L.F.P.S. Glas., Melbourne, Victoria.

Martin, R., L.R.C.P. Edin., L.F.P.S. Glas., Dunedin, New Zealand.

Mason, J., M.D., D.P.H. Cantab., Otaki, New Zealand.

Maudsley, H., M.D. Lond., M.R.C.S. Eng., M.R.C.P. Lond., Melbourne, Victoria.

Menzies, E., M.R.C.S. Eng., Napier, New Zealand.

Menzies, P. W., L.R.C.P. and S. Edin., L.F.P.S. Glas., Napier, New Zealand.

Meyer, F. H., M.B., B.S. Melb., Melbourne, Victoria.

Mickle, A. F. J., M.D., C.M. Aberd., L.R.C.P. and S. Edin., Christchurch, New Zealand.

Mirbach, R. Von, M.D. Munich, Waipawa, New Zealand.

Monckton, F. A., M.R.C.S. Eng., Feilding, New Zealand.

Moore, J. J., L.R.C.S. Irel., L.K.Q.C.P. Irel., Dublin, Ireland.
Moore, T. C., M.D., C.M. Dub., Napier, New Zealand.
Moorhouse, B. M., M.B., C.M Edin., M.R.C.S. Eng., Christchurch, New Zealand.
Morice, C. L., M.R.C.S. Eng., L.S.A. Lond., Greymouth, New Zealand.
Morier, C. G. Drummond, L.R.C.S. Irel., L.K.Q.C.P. Irel., Nairne, South Australia.
Morris, E. W., M.R.C.S. Eng., L.R.C.P. Lond., Port Adelaide, South Australia.
Morton, D. M., M.B., B.S. Melb., Melbourne, Victoria.
Morton, F. W. W., L.R.C.P. and S Edin., Melbourne, Victoria.
Muir, James M. M., M.B , C.M., Wynyard, Tasmania.
Mulholland, J. A. D., M.B., C.M. Glas., Invercargill, New Zealand.
Mullin, W. J., M.B., Ch.B N.Z , Roxburgh, New Zealand.
Mullins, G. L., M.A., M.D. Dub., Sydney, New South Wales
Munro, W. J., M.B., C.M. Edin., M.R C.S. Eng., Sydney, New South Wales.
Murdoch, J., F.R.C.S., L.R.C.P. Edin., Christchurch, New Zealand.
Murray-Aynsley, J. H., M R.C.S. Eng., L R.C.P. Lond., Eketahuna. New Zealand.
Muskett, P. E., L.R.C.P. and S. Edin., Sydney, New South Wales.
Nash, J. B., M.D., C.M. Edin., M.R.C.S. Eng., Wallsend, New South Wales.
Naylor, H. G. H., L.R.C.P. and S. Edin., Hobart, Tasmania.
Neale, A. F., M.D. Edin., Palmerston South, New Zealand.
Neill, L. E. F., B.A., M.B. Ch. M. Syd., Sydney, New South Wales.
Neild, J. E., M D., B.S. Melb., L.S.A. Lond., Melbourne, Victoria
Newell, J. A., M.B , Ch. B. N.Z., Lawrence, New Zealand.
Nickson, W. J. R., M.D., C.M., Q.U. Irel , Newcastle, New South Wales.
Nicoll, J. R., M.A., M.B., C.M. Aberd., Goodna, Queensland.
Noyes, A. W. F., M.R.C.S. Eng., Deniliquin, New South Wales.
O'Brien, J. A., M.B., C.M. Glas , Sunbury, Victoria.
Ogston, F., M.D., C.M. Aberd., Dunedin, New Zealand.
O'Hara, H. M., F.R.C.S. Irel., M.K.Q.C.P. Irel., Melbourne, Victoria.
Ovenden, W. H., L.K.Q.C.P. Irel., L.R.C S. Irel., Christchurch, New Zealand
Palmer, J. C., M.B., C.M. Edin., F.R.C.S. Edin., Christchurch, New Zealand.
Pardey, J. M., M.B., B.S. Melb., Launceston, Tasmania.
Pickburn, T. J., M.D., C.M. Aber., M.R.C S. Eng., L S A. Lond., Sydney, New South Wales.
Pinnock, R. D., M.D., C.M. Glas., Ballarat, Victoria.
Pollen, H., M.D., C.M. Dub., Wellington, New Zealand.
Pope, R. J., M.D., C.M. Edin , F.R.C.S. Edin., Sydney, New South Wales.
Popham, F. W. H., M.R.C.S. Eng , L.R.C.P. Edin., L S.A. Lond., Gawler, South Australia.
Poulton, B., M.D., B.S. Melb., M.R.C S. Eng., Adelaide, South Australia.
Prins, H. H., M.R.C.S. Eng., Christchurch, New Zealand.
Purchas, A. C., M.B., C.M. Edin., M.R.C.S. Eng., Auckland, New Zealand.
Purdy, J. R., M.B., C.M. Aberd., The Hutt, New Zealand.
Purser, C., B.A., M.B., Ch.M. Syd., Sydney, New South Wales.
Quaife, F. H., M.D., C.M. Glas., Sydney, New South Wales.
Rabl, H., M.D. Munich, Murtoa, Victoria.
Rawson, E., M.R.C.S. Eng., L.S.A. Lond., Wellington, New Zealand.
Reading, R. F., M.R.C.S. Eng., L.R.C.P. Lond., Sydney, New South Wales.

Reddall, O. H., M.R.C.S. Eng., L R.C.P. Lond , Sydney, New South Wales.
Reid, J. H., M.B., Ch B. N.Z., Denniston, New Zealand.
Reid, R. S., L.R.C P. and S., Edin , Timaru, New Zealand.
Reimer, C. N., M.D., Dunedin, New Zealand.
Rennie, G. E., M.D. Lond , M.R.C.S. Eng., Sydney, New South Wales.
Roberton, E , M.D., C.M. Edin., M.R C.S, Eng , Auckland, New Zealand.
Roberts, W. S , M.R C.S. Eng , Dunedin, New Zealand.
Ross, Chisholm, M.D. Syd., M.B., C.M. Edin., Goulburn, New South Wales.
Ross, M. W., M.B , Ch. B. N.Z., Dunedin, New Zealand.
Rowley, C., M.R.C.S. Eng., Otahuhu, New Zealand.
Rutledge, C. J., L.R C.S. Irel., Allendale, Victoria.
Ryan, C. S., M.B., C.M. Edin., Melbourne, Victoria.
Ryan, T. F , M.B. Melb., Kaniva, Victoria.
Salter, A. E., M B., B.S. Melb., Thursday Island, Queensland.
Saunders, G. R., M.B., M.C. Cantab., M.R.C.S. Eng., L.R.C.P. Lond., Wanganui, New Zealand.
Schlink, R. H., M.D., Wodonga, Victoria.
Scott, J. H., M.D., C.M. Edin., M.R.C.S. Eng., Dunedin, New Zealand.
Scott, R., M.B., C.M. Glas., Ballarat, Victoria.
Scott, R. G., M.B., C.M. Edin., Hobart, Tasmania.
Scott, W. G., M.D. Durh., M.R.C.S. Eng., L.S.A. Lond., Onehunga, New Zealand.
Skerman, S., M.R.C.S. Eng., L.S.A. Lond., Marton, New Zealand.
Skirving, R. Scot, M.B., C.M. Edin., Sydney, New South Wales.
Smith, J. Gibson, L R.C.S. Edin , Balclutha, New Zealand.
Smith, J. W., L.R.C P. Edin., Sydney, New South Wales.
Smith, M. Lomax, M.R.C.S. Eng., L.R C.P. Edin., Christchurch, New Zealand.
Smith, W. Beattie, F.R C.S. Edin., L R C P. Edin., Ararat, Victoria.
Smith, W. M., M.B., M.C. Cantab., Dunedin, New Zealand
Snowball, W., M.B., B.S. Melb , L.R.C.S. Edin., L.S.A. Lond , Melbourne, Victoria.
Springthorpe, J. W., M.A , M.D., B.S. Melb., M R.C.P. Lond , Melbourne, Victoria.
Sprott, G , M.D , C.M., D.P.H. Glas., Hobart, Tasmania.
Stapleton, J. J., M.D., C.M. Edin., M R.C.S. Eng., Lambton, New South Wales.
Steel, J., M.B., C.M. Edin., L R.C.P. and S. Edin., Kew, Victoria.
Stenhouse, W. M., M D , C.M. Glas , Dunedin, New Zealand.
Stephenson, R. S , M.B., C.M. Edin., Dunedin, New Zealand.
Stewart, P., M D. Glas , Milton, New Zealand.
Stirling, E. C., M.A., M.D. Cantab., F.R C.S. Eng , Adelaide, South Australia.
Stirling, R. A., M.B , B.S. Melb., L.R.C.P. and S. Edin., Melbourne, Victoria.
Stuart, T. P. Anderson, M.D., C.M. Edin., Sydney, New South Wales.
Sweet, G. B , M B., Ch M. Syd., Napier, New Zealand.
Swift, H., M.D. Cantab , M.R.C.S. Eng., Adelaide, South Australia.
Syme, G. A., M.B., M.S. Melb., F R.C.S. Eng., Melbourne, Victoria.
Symes, W. H., M.D., C.M Edin., B.Sc. Paris, Christchurch, New Zealand.
Symons, M. J., M.D., C.M. Edin., Adelaide, S.A.
Taylor, Hon. W. F., M.L.C., M.D.Q.C. Kingston, M.R.C.S. Eng., L.S.A. Lond., D.P.H., Brisbane, Queensland.

Teevan, H., M.R.C.S. Eng., L.S.A. Lond., Geraldine, New Zealand
Terrey, C., M.B., C.M. Edin., Kiama, New South Wales.
Thomas, C. E., M.R.C.S. Eng., Timaru, New Zealand.
Thomas, W., M.B., C.M. Glas., Christchurch, New Zealand.
Thomas, W. Duncan, M.B. Lond., M.R.C.S. Eng., L.S.A. Lond., Bundaberg, Queensland.
Thompson, J. A., M.D. Brux., M.R.C.S. Eng., Sydney, New South Wales
Thomson, A. Milne, M.B., C.M. Edin., Napier, New Zealand.
Thomson, J., M.B., C.M. Edin., Brisbane, Queensland.
Thomson, J. R. M., M.B., B.S. Melb., Essendon, Victoria.
Tidswell, F., M.B., Ch.M. Syd., Sydney, New South Wales.
Todd, C. E., M.D. Brux., M.R.C.S. Eng., L.R.C.P. Lond., Adelaide, South Australia.
Tofft, W. H., M.B., C.M. Edin., Campbelltown, Tasmania.
Townend, J. H., L.R.C.P. Edin., L.S.A. Lond., Christchurch, New Zealand.
Traill, M. W., M.R.C.S. Eng., L.R.C.P. Lond., Sydney, New South Wales.
Trimnell, T. J., M.R.C.S. Eng., Mongonui, New Zealand.
Trotter, N. G., M.D., C.M. Edin., Tapanui, New Zealand.
Turner, A. Jefferis, M.D. Lond., M.R.C.S. Eng., Brisbane, Queensland.
Vause, A. J., M.B., C.M. Edin., Sydney, New South Wales.
Verco, J. C., M.D., B.S. Lond., F.R.C.S. Eng., L.R.C.P. Lond., Adelaide, South Australia.
Voss, F. H. V., F.R.C.S. Eng., L.S.A. Lond., Rockhampton, Queensland.
Walker, H., L.F.P.S. Glas., Auckland, New Zealand.
Ward, J., M.D. St. And., M.R.C.S. Eng., Ophir, New Zealand.
Warren, W. E., M.D., Ch.M., Q.U. Irel., Sydney, New South Wales.
Watkins, S. C., M.R.C.S. Eng., Manly, New South Wales.
Watson, A., M.D. Paris and Gott., F.R.C.S. Edin., L.S.A. Lond., Adelaide, South Australia.
Webster, P. S., M.D. Dub., M.R.C.S. Eng., L.R.C.P. Lond., Melbourne, Victoria.
Way, E. Willis, M.B. Edin., M.R.C.S. Eng., L.R.C.P. Lond., Adelaide, South Australia.
Whitton, J., M.D., Q.U. Irel., L.R.C.S. Edin., Oamaru, New Zealand.
Whitton, T. B., M.D., Q.U. Irel., L.R.C.S. Edin., Reefton, New Zealand.
Will, W. J., M.B., C.M. Edin., Dunedin, New Zealand.
Williams, J., M.D. Edin., M.R.C.S. Eng., Melbourne, Victoria.
Williams, J. W., M.B., C.M. Edin., Gisborne, New Zealand.
Willis, T. R. H., M.B., B.S. Melb., Daylesford, Victoria.
Wilson, J. T., M.B., C.M. Edin., Sydney, New South Wales.
Wine, H. C., M.R.C.S. Eng., L.S.A. Lond., Auckland, New Zealand.
Woinarski, S. E. A. Z., B.S. Melb., F.R.C.S. Irel., Ballarat, Victoria.
Wolfhagen, J. E., M.B., C.M. Edin., Hobart, Tasmania.
Wood, P. M., M.R.C.S. Eng., L.R.C.P. Lond., Sydney, New South Wales.
Worrall, R., M.D., C.M. Q.U. Irel., Sydney, New South Wales.
Young, H. C. Taylor, M.B. C.M. Glas., Grafton, New South Wales.
Young, J., M.D., Ch.M. Q.U. Irel., Invercargill, New Zealand.
Young, W., M.D., C.M. Edin., Wellington, New Zealand.

Honorary Members.

Bickerton, A. W., F.C.S., Professor of Chemistry and Physics, Canterbury College, Christchurch, New Zealand

Black, James Gow, D.Sc. Edin., Professor of Chemistry, University of Otago, Dunedin, New Zealand.

Brown, Frederick D., M.A. Oxon., B.Sc. Lond., F.C.S., Professor of Chemistry and Physics, University College, Auckland, New Zealand.

Cameron, Samuel Sherwen, M.R.C.V.S., Dunedin, New Zealand

Charlton, A. R., M.R.C.V.S., Christchurch, New Zealand.

Dendy, Arthur, D.Sc. Vic., Professor of Biology, Canterbury College, Christchurch, New Zealand.

Gilruth, J. A., M.R.C.V.S., Government Veterinary Surgeon, Wellington, New Zealand.

Kidston-Hunter, A. G., Dunedin, New Zealand.

Park, Archibald, M.R.C.V.S., Government Veterinary Surgeon, Wellington, New Zealand.

Parker, Thomas Jeffery, D.Sc. Lond., F.R.S., Professor of Biology, University of Otago, Dunedin, New Zealand.

Thomas, Algernon P. W., M.A. Oxon., Professor of Biology, University College, Auckland, New Zealand.

Sections and Sectional Officers.

SECTION I.

MEDICINE

INCLUDING DISEASES OF THE SKIN.

President - - Alfred Austin Lendon, M.D. Lond., M.R.C.S. Eng., Lecturer on Clinical Medicine, University of Adelaide, South Australia.

Vice-Presidents - James Jamieson, M.D., C.M. Glas., Lecturer on Medicine, University of Melbourne, Victoria.

David Grant, M.A., M.D., C.M. Edin., Lecturer on Materia Medica, University of Melbourne, Victoria.

John Lockhart Gibson, M.D., C.M. Edin., M.R.C.S. Eng., Brisbane, Queensland.

Robert Scot Skirving, M.B., C.M. Edin., Lecturer on Clinical Medicine, University of Sydney, New South Wales.

Joint Secretaries - Daniel Colquhoun, M.D. Lond., M.R.C.P. Lond., High Street, Dunedin, New Zealand.

George Richard Saunders, M.B., M.C. Cantab., Wanganui, New Zealand.

SECTION II.

SURGERY

INCLUDING AS A SUB-SECTION DISEASES OF THE EYE, EAR, AND THROAT.

President - - Henry Michael O'Hara, F.R.C.S. Irel., M.K.Q.C.P. Irel., Melbourne, Victoria.

Vice-Presidents - Alexander MacCormick, M.D., C.M. Edin., M.R.C.S. Eng., Lecturer on Surgery, University of Sydney, New South Wales.

William Anstey Giles, M.B., C.M. Edin., Lecturer on Aural Surgery, University of Adelaide, South Australia.

John Thomson, M.B., C.M. Edin., Brisbane, Queensland.

Samuel Thomas Knaggs, M.D. Dub., F.R.C.S. Irel., M.K.Q.C.P. Irel., Lecturer on Clinical Surgery, University of Sydney, New South Wales.

James Jackson, M.D. Lond., M.R.C.S. Eng., Melbourne, Victoria; also Chairman of the Sub-section for Diseases of the Eye, Ear, and Throat.

Joint Secretaries - William Brown, M.A., M.B., C.M. Edin., High Street, Dunedin, New Zealand.

John Henry Murray-Aynsley, M.R.C.S. Eng., L.R.C.P. Lond., Eketahuna, New Zealand.

SUB-SECTION.

DISEASES OF THE EYE, EAR, AND THROAT.

Chairman - - James Jackson, M.D. Lond., M.R.C.S. Eng., Melbourne, Victoria.

Joint Secretaries - Henry Lindo Ferguson, M.D. Dub., F.R.C.S. Irel., High Street, Dunedin, New Zealand.

Francis Wallace Mackenzie, M.B., C.M. Edin., Willis Street, Wellington, New Zealand.

SECTION III.

MIDWIFERY, AND DISEASES OF WOMEN.

President - - Edward Willis Way, M.B. Edin., L.R.C.P. Lond., M.R.C.S. Eng., Lecturer on Diseases of Women, University of Adelaide, South Australia.

Vice-Presidents - Richard Stonehewer Bright, M.R.C.S. Eng., Hobart, Tasmania.

Felix Henry Meyer, M.B., B.S. Melb., Melbourne, Victoria.

Ralph Worrall, M.D., C.M., Q.U. Irel., Sydney, New South Wales.

Charles Ferdinand Marks, M.D., Q.U. Irel., M.R.C.S. Eng., Brisbane, Queensland.

Joint Secretaries - Thomas Morland Hocken, M.R.C.S. Eng., Moray Place, Dunedin, New Zealand.

George Cleghorn, M.D. Durh., M.R.C.S. Eng., Blenheim, New Zealand.

SECTION IV.

PUBLIC HEALTH.

INCLUDING STATE MEDICINE, FORENSIC MEDICINE, PSYCHOLOGICAL MEDICINE, AND DEMOGRAPHY.

President - - John William Springthorpe, M.D., B.S. Melb., M.R.C.P. Lond., Lecturer on Hygiene, University of Melbourne, Victoria.

Vice-Presidents - William Henry Goode, M.A., M.D., C.M. Dub., Lecturer on Medical Jurisprudence and Public Health, University of Sydney, New South Wales.

David Hardie, M.D., C.M. Aberd., Brisbane, Queensland.

James Edward Neild, M.D., B.S. Melb., L.S.A. Lond., Lecturer on Forensic Medicine, University of Melbourne, Victoria.

Chisholm Ross, M.D. Syd., C.M. Edin., Lecturer on Psychological Medicine, University of Sydney, New South Wales.

Joint Secretaries - Francis Ogston, M.D., C.M. Aberd , High Street, Dunedin, New Zealand.

Thomas Hope Lewis, M.R.C.S. Eng., Symonds Street, Auckland, New Zealand.

SECTION V.

ANATOMY, PHYSIOLOGY, PATHOLOGY, AND PHARMACOLOGY.

President - - Archibald Watson, M.D. Paris, F.R.C.S. Edin., Professor of Anatomy, University of Adelaide, South Australia.

Vice-Presidents - James William Barrett, M.D., B.S. Melb., F.R.C.S. Eng., Demonstrator of Physiology, University of Melbourne, Victoria

Eugen Hirschfeld, M.D. Stras., Brisbane, Queensland.

William Lomax Cleland, M.B., C.M. Edin., Lecturer on Materia Medica, University of Adelaide, South Australia.

Henry Maudsley, M.D., M.R.C.P. Lond., M.R.C.S. Eng., Melbourne, Victoria.

James Thomas Wilson, M.B., C.M. Edin., Professor of Anatomy, University of Sydney, N.S.W.

Joint Secretaries - William Stewart Roberts, M.R.C.S. Eng., Moray Place, Dunedin.

Edward Jennings, M.R.C.S. Eng., L.R.C.P. Lond., Christchurch.

List of Papers Contributed to the Congress.

SECTION I.

MEDICINE, &c.

An Unusual Case of Acute Lead-poisoning from Tea Drinking.

G. L. Mullins, M.A., M.D. Dub., Sydney, New South Wales.

A Case of Pharyngomycosis Leptothricia.

C. Purser, B.A., M.B., Ch.M. Syd., Sydney, New South Wales.

F. Tidswell, M.B., Ch.M. Syd., Sydney, New South Wales.

A Case of Diabetes Mellitus from Cancer of Pancreas.

G. Sprott, M.D., C.M. Glas., Hobart, Tasmania.

Thermal Springs of New Zealand.

T. Hope Lewis, M.R.C.S. Eng., Auckland, New Zealand.

Notes on a Case of Cretinism, Treated with Thyroidin.

C. Morton Anderson, M.R.C.S. Eng., Christchurch, New Zealand.

Tuberculosis of the Skin.

A. W. F. Noyes, M.R.C.S. Eng., Deniliquin, New South Wales.

On Reichmann's Disease, and some other Stomach Conditions.

D. Colquhoun, M.D. Lond., M.R.C.P. Lond., Dunedin, New Zealand.

On the Comparative Prognosis and Treatment of Different Forms of Cardiac Disease.

J. Jamieson, M.D., C.M. Glas., Melbourne, Victoria.

Cases of Diphtheria, Treated by Anti-toxin.

A. Jefferis Turner, M.D. Lond., M.R.C.S. Eng., Brisbane, Queensland.

J. Ashworth, M.B., C.M., Brisbane, Queensland.

Treatment of Anchylostomiasis.

A. Jefferis Turner, M.D. Lond., M.R.C.S. Eng., Brisbane, Queensland.

Therapeutics of Typhoid in Country Practice.

H. Rabl, M.D. Munich, Murtoa, Victoria.

Laryngismus Stridulus.

C. P. W. Dyring, M.B. Melb., Coburg, Victoria.

The Philosophy of Disease.

M. Lomax Smith, M.R.C.S. Eng., L.R.C.P. Edin., Christchurch, New Zealand.

On Acromegaly.

R. Scot Skirving, M.B., C.M. Edin., Sydney, New South Wales.

Some General Medical Aspects of Nasal Obstruction.

J. Lockhart Gibson, M.D., C.M. Edin., M.R.C.S. Eng., Brisbane, Queensland.

Progress Report on a Case of Sporadic Cretinism.

J. Lockhart Gibson, M.D., C.M. Edin., M.R.C.S. Eng., Brisbane, Queensland.

Gall Stone of Unusual Size.

A. Martin, M.D. Lond., M.R.C.P. Lond., M.R.C.S. Eng., Wellington, New Zealand.

Brief Note on a Novel Method of Treating Tuberculosis.

James Murdoch, F.R.C.S., L.R.C.P. Edin., Christchurch, New Zealand.

SECTION II.

SURGERY.

Removal of a Tumour from the Brain.

W. Gardner, M.D., C.M. Glas., Melbourne.

The Intraperitoneal Treatment of Hydatid Cysts of the Abdominal Cavity.

W. Gardner, M.D., C.M. Glas., Melbourne.

Castration for Enlarged Prostate.

W. Gardner, M.D., C.M. Glas., Melbourne.

A New Kind of Talipes.

W. Kent Hughes, M.B. Lond., M.R.C.S. Eng., Melbourne.

Intubation in the Treatment of Diphtheria. Further Record of Cases.

A. Jefferis Turner, M.D. Lond., M.R.C.S. Eng., Brisbane, Queensland.

Some Points in the Surgical Treatment of Empyæma in Children.

W. W. R. Love, M.B., C.M. Edin., Brisbane, Queensland.

Hydatid Disease.

L. Bernstein, M.D. Heidelberg, Lismore, New South Wales.

Four Cases of Renal Calculus, and the Effects on Surrounding Tissues of Operative Treatment.

J. B. Nash, M.D., C.M. Edin., M.R.C.S. Eng., Wallsend, New South Wales.

A Case of Section of the Spermatic Cords for Hypertrophy of the Prostate.

C. H. Haines, M.D., C.M., Q.U. Irel., Auckland, New Zealand.

Thyroidectomy.

A. Martin, M.D. Lond., M.R.C.S. Eng., M.R.C.P. Lond., Wellington, New Zealand.

A New Treatment of Urinary Fistula by Transplantation of Animal Urethra.

J. H. Murray-Aynsley, M.R.C.S. Eng., L.R.C.P. Lond., Christchurch, New Zealand.

An Efficient and Simple Apparatus for the Treatment of Dislocation of the Acromial End of the Clavicle.

H. A. de Lautour, M.R.C.S. Eng., Oamaru, New Zealand.

Thyroidectomy in Graves' Disease.

J. O. Closs, M.D., C.M. Edin., Dunedin, New Zealand.

Hypertrophy of the Prostate.

J. O. Closs, M.D., C.M. Edin., Dunedin, New Zealand.

Statistics of all Abdominal Operations in the Adelaide Hospital during the Last Ten Years.

C. E. Todd, M.D. Brux., M.R.C.S. Eng., L.R.C.P. Lond., Adelaide, South Australia.

Some Observations on the Causes of Relapse after the Operation for the Radical Cure of Inguinal Hernia.

L. E. Barnett, M.B., C.M. Edin., F.R.C.S. Eng., Dunedin, New Zealand.

A Case of Spontaneous Shrivelling of a Cancer of the Foot.
L. E. Barnett, M.B., C.M. Edin., F.R.C.S. Eng., Dunedin, New Zealand.
A Case of Large Cystic Kidney.
W. Brown, M.A., M.B., C.M. Edin., Dunedin, New Zealand.
Notes on Some Cases of Hydatids.
W. Brown, M.A., M.B., C.M. Edin., Dunedin, New Zealand.
A Case of Resection of the Bowel, with the Use of Murphy's Button.
J. H. Townend, L.R.C.S. Edin., L.S.A. Lond., Christchurch, New Zealand.
Minute Hernia in the Linea Alba as a Cause of Obstinate Dyspepsia.
G. Cleghorn, M.D. Durh., M.R.C.S. Eng., Blenheim, New Zealand.
A Case of Nephrolithotomy.
H. A. de Lautour, M.R.C.S. Eng., Oamaru, New Zealand.
Short Notes of Cases of Inoperable Cancer, Treated by Injections of the Toxins of Erysipelas and Allied Methods.
G. Cleghorn, M.D. Durh., M.R.C.S. Eng., Blenheim, New Zealand.
A Case of Sarcoma of the Femur, in which Complete Cure occurred after Incision and Removal of a Piece of the Growth for Microscopic Examination.
G. Cleghorn, M.D. Durh., M.R.C.S. Eng., Blenheim, New Zealand.
The Sequelæ of Two Cases of Brain Operations reported at Last Meeting of the Congress.
G. Cleghorn, M.D. Durh., M.R.C.S. Eng., Blenheim, N.Z.

SUB-SECTION.

DISEASES OF THE EYE, EAR, AND THROAT.

Hypermetropia a Possible Cause of Optic Nerve Atrophy.
H. Armstrong, F.R.C.S. Eng., L.R.C.P. Lond., Hobart, Tasmania.
On the Spectacle Treatment of Concomitant Convergent Strabismus.
J. W. Barrett, M.D., B.S. Melb., F.R.C.S. Eng., Melbourne, Victoria.
P. S. Webster, M.D., Dub., M.R.C.S. Eng., L.R.C.P. Lond., Melbourne, Victoria.
The Significance of Fine Opacities in the Vitreous.
J. W. Barrett, M.D., B.S. Melb., F.R.C.S. Eng., Melbourne, Victoria.
P. S. Webster, M.D. Dub., M.R.C.S. Eng., L.R.C.P. Lond., Melbourne, Victoria.
Rhinitis Chronica Atrophicans Fœtida.
T. K. Hamilton, B.A., M.D. Dub., F.R.C.S. Irel., Adelaide, South Australia.
Glaucoma Simplex.
T. K. Hamilton, B.A., M.D. Dub., F.R.C.S. Irel., Adelaide, South Australia.
Two Cases of Sarcoma Invading the Orbit.
F. W. Mackenzie, M.B., C.M. Edin., Wellington, New Zealand.
On the Examination of the Nasal Fossæ in General Diseases.
W. G. Scott, M.R.C.S. Eng., Onehunga, New Zealand.
Ante-natal Adenoid Growths as a Cause of Deaf-Mutism.
W. M. Stenhouse, M.D., C.M. Glas., Dunedin, New Zealand.

The Ætiology of Scleritis.
W. M. Stenhouse, M.D., C.M. Glas., Dunedin, New Zealand.

Case of Forward Dislocation of the Lens—Traumatic Myopia—Retained Power of Accommodation.
J. Lockhart Gibson, M.D., C.M. Edin., M.R.C.S. Eng., Brisbane, Queensland.

Case of Double Aniridia, with Eight Diopters of Hypermetropia, and Unilateral, Partial, Compensatory Opacity of Lens.
J. Lockhart Gibson, M.D., C.M. Edin., M.R.C.S. Eng., Brisbane, Queensland.

Unusually High Degree of Hypermetropia (+ 16 D), Lens Present.
J. Lockhart Gibson, M.D., C.M. Edin., M.R.C.S. Eng., Brisbane, Queensland.

Operations on the Mastoid Process in connection with Suppurative Diseases of the Middle Ear.
A. J. Brady, L.R.C.S. Irel., L.K.Q.C.P. Irel., Sydney, New South Wales.

Pterygium.
A. C. Purchas, M.B., C.M. Edin., M.R.C.S. Eng., Auckland, New Zealand.

Cases of ania after Cataract Extraction.
H. Lindo Ferguson, M.D. Dub., F.R.C.S. Irel., Dunedin, New Zealand.

Section III.

MIDWIFERY, AND DISEASES OF WOMEN.

A New Clamp, designed on an Entirely New Principle, for securing the Broad Ligament in Vaginal Hysterectomy.
J. H. Townend, L.R.C.P. Edin., L.S.A. Lond., Christchurch, New Zealand.

A Case of Dermoid Cyst, coincident with Pregnancy.
R. Scott, M.B , C.M. Glas., Ballarat, Victoria.

Puerperal Eclampsia, with Special Reference to Urea Excretion.
W. W. R. Love, M.B., C.M. Edin., Brisbane, Queensland.

The Rapid Dilatation of the Os Uteri during Labour.
J. R. Purdie, M.B., C.M. Aberd., Wellington, New Zealand.

Puerperal Fever.
A. I. Garland, M.R.C.S. Eng., L.R.C.P. Edin., Oamaru, New Zealand.

Three Cases of Removal of Cyst of the Broad Ligament.
G. Rothwell Adam, M.B , C M. Edin., Melbourne, Victoria.

A New Form of Needle Holder, and a New Vaginal Pessary.
C. G. Campbell, M.B , C.M. Edin., Christchurch, New Zealand.

On the Treatment of Retro Displacement of the Uterus.
R. Worrall, M.D., C.M , Q.U. Irel., Sydney, New South Wales.

Section IV.

PUBLIC HEALTH, &c.

Death Certification and Registration in New South Wales.
G. Lane Mullins, M.A., M.D. Dub., Sydney, New South Wales.

Discussion on Rural Hygiene, with Notes on the Analysis of Well Waters.
J. Mason, M.D., D.P.H. Cantab., Otaki, New Zealand.

A Paper on the Public Health Aspect of Alcohol.
W. Cole Chapple, M.B., Ch.B. N.Z., Wellington, New Zealand.

Discussion on the Notification of Infectious Diseases.
F. Ogston, M.D., C.M. Aberd., Dunedin, New Zealand.

A Paper on Education and Health.
W. M. Stenhouse, M.D., C.M. Glas., Dunedin, New Zealand.

The Examination of Drinking Water from a Bacteriological and Chemical Point of View.
A. G. Kidston-Hunter, Dunedin, New Zealand.

A Paper on the Distinction between the Appearance of Razors, &c., in Cases of Homicide and Suicide.
H. A. de Lautour, M.R.C.S. Eng., Oamaru, New Zealand.

A Paper on a Simple Method of Fixing and Preserving Imprints of Foot or Finger Marks.
H. A. de Lautour, M.R.C.S. Eng., Oamaru, New Zealand.

A Paper on Insanity from Association, or *Folie a Deux*.
H. C. McDouall, M.R.C.S. Eng., L.R.C.P. Lond., Gladesville, New South Wales.

Structural Changes in the Nervous System Accompanying Mental Diseases, with Special Reference to General Paralysis.
F. Truby King, M.B., C.M., B.Sc. Edin., Dunedin, New Zealand.

On Leprosy in Queensland.
W. Love, M.B., C.M. Edin., Brisbane, Queensland.

SECTION V.

ANATOMY, &c.

Anatomy of the Olfactory Tract.
G. Elliot Smith, M.D., Ch.M. Syd., Sydney, New South Wales.

Some Cases of Sternalis Muscle, with Notes upon its Innervation.
J. T. Wilson, M.B., C.M. Edin., Sydney, New South Wales.

Note upon the Stephanion, and on Various Descriptions of the Temporal Bones.
J. W. Wilson, M.B., C.M. Edin., Sydney, New South Wales.

Histology of Tumours of the Kidney.
H. B. Allen, M.D., B.S. Melb., Melbourne, Victoria.
T. Cherry, M.D., B.S. Melb., Melbourne, Victoria.

Zoo-parasitic Tuberculosis.
A. Park, M.R.C.V.S., Wellington, New Zealand.

PREFACE.

THE Literary Committee regret the delay in issuing the Transactions of the Congress of 1896. This delay was due to the fact that a large part of the matter had to go in proof to Australia, and printing was therefore necessarily slow.

The Committee have to acknowledge most gratefully the help of the Government of New Zealand towards the production of this volume. As has also been the case in the other colonies, the Premier, Mr. Seddon, and his colleagues, recognised that those medical men who supported the Congress had no selfish ends in view. On the contrary, its success could only mean in the long run a diminution of their gains by the application of improved methods for the treatment of disease, the use of rational means for the prevention of sickness, and maintaining the public health at a high level.

The Committee are sure that the medical profession in New Zealand is none the less grateful to the Government for their most courteous and ready help towards the success of the Congress, although they recognise that this help was given on the general ground of the good that must ultimately accrue to the mass of the population from such meetings.

The Committee have also to thank the editors of the *Otago Daily Times* and of the *Evening Star* for the reports of the discussions on general subjects, and of much of the daily work of the Congress, of which they have availed themselves in publishing these Transactions.

FERD. C. BATCHELOR.

DUNEDIN, *March, 1897.*

CONTENTS.

PAGE

INAUGURAL MEETING - - - - - - - 1

THE MAYOR'S LUNCHEON - - - - - - - 6

OPENING CEREMONY - - - - - - - 13

PRESIDENT'S ADDRESS. F. C. BATCHELOR - - - - 17

GENERAL MEETINGS, DISCUSSIONS, &c. - - - - - 35

SECTION OF MEDICINE—

President's Address. A. A. Lendon - - - - 59

On the Comparative Prognosis and Treatment of Different Forms of Cardiac Disease. James Jamieson - - - - 66

An Interesting Case of Diabetes Mellitus—Cancer of Pancreas. Gregory Sprott - - - - - - - 72

The Cold Bath Treatment of Typhoid Fever in Country Practice. H. Rabl - - - - - - - - 78

Treatment of Spasmodic Laryngitis or Croup. C. P. W. Dyring 84

Discussion on the Treatment of Spasmodic Laryngitis or Croup - 85

Fifty Cases treated with Diphtheria Anti-toxin. A. J. Turner and L. N. Ashworth - - - - - - 86

Discussion on Diphtheria Anti-toxin - - - - 92

Some General Medical Aspects of Nasal Obstruction. J. Lockhart Gibson - - - - - - - - 93

A Case of Pharyngo-Mycosis Leptothricia. C. Purser and F. Tidswell - - - - - - - - 97

The Treatment of Anchylostomiasis. A. Jefferis Turner - 101

On the Diagnosis of Reichmann's Disease and some other Stomach Conditions. D. Colquhoun - - - - - 104

On Acromegaly. R. Scot Skirving - - - - 110

Progress Report of a Myxœdematous Sporadic Cretin. J. Lockhart Gibson - - - - - - - 116

SECTION OF MEDICINE *(Continued)*—

PAGE

Notes on a Case of Cretinism successfully treated with Thyroidin. C. M. Anderson - - - - - - - 117

An Unusual Case of Acute Lead-Poisoning from Tea Drinking. G. L. Mullins - - - - - - - 119

The Thermal Springs of New Zealand. T. Hope Lewis - - 120

The Philosophy of Disease: A Study in Pathogenesis. M. Lomax Smith - - - - - - - - 124

Tuberculosis of the Skin and Cutaneous Manifestations occurring in Scrofulous Subjects. A. W. Finch Noyes - - - 135

A Few Notes upon an Unusually Large Gall Stone, passed during Life. Albert Martin - - - - - - 144

Brief Note on a Novel Method of treating Tuberculosis of the Lungs. James Murdoch - - - - - 145

On a Case of Complete Leucoderma. Mr. Pulleine - - 147

SECTION OF SURGERY—

President's Address. Henry O'Hara - - - - 149

Partial Thyroidectomy. Albert Martin - - - . 158

Thyroidectomy in Graves's Disease. J. O. Closs - - - 160

Discussion on Thyroidectomy - - - - - 165

Small Herniæ in the Linea Alba. George Cleghorn - - 165

Case of Fæcal Fistula treated by Resection with Murphy's Button. J. H. Townend - - - - - - 167

A Case of Strangulated Hernia, complicated with Internal Obstruction. F. Bowe - - - - - - 170

Statistics of Abdominal Operations at Adelaide Hospital. C. E. Todd - - - - - - - - 173

Section of Spermatic Cords for Hypertrophy of Prostate. C. H. Haines - - - - - - - - 189

Hypertrophy of the Prostate. J. O. Closs - - - - 191

Discussion on Hypertrophy of the Prostate - - - - 197

Treatment of Chronic Urinary Fistulæ by Cystotomy and Transplantation. J. H. Murray-Aynsley - - - - 198

Four Cases of Renal Calculus: The Effects on Surrounding Tissues and their Treatment by Operation. J. B. Nash - 201

A Case of Spontaneous Shrivelling of a Cancer of the Foot. L. E. Barnett - - - - - - - - 208

SECTION OF SURGERY *(Continued)*—

PAGE

A Case of Nephrolithotomy—Removal of Twenty-six Calculi. Harry A. de Lautour - - - - - - 210

Short Notes of Cases of Inoperable Cancer. George Cleghorn - 211

A Case of Sarcoma of the Femur. George Cleghorn - - 213

A Simple but Effective Apparatus for the Treatment of Dislocation of the Acromial End of the Clavicle, Upwards and Backwards. Harry A. de Lantour - - - - 214

A New Kind of Talipes. W. Kent Hughes - - - 216

The Sequels of Two Cases of Brain Operations reported at the Intercolonial Medical Congress of 1893. George Cleghorn - 218

SUB-SECTION OF DISEASES OF THE EYE, EAR AND THROAT—

Hypermetropia a Possible Cause of Optic Nerve Atrophy. Hugh Armstrong - - - - - - - 218

Discussion on Hypermetropia - - - - - 221

Colour Blindness and Impaired Vision in Sailors and those Persons employed on the Railways. James Jackson - - - 221

Discussion on Colour Blindness - - - - - 223

The Treatment of Concomitant Convergent Strabismus. James W. Barrett - - - - - - - 225

Discussion on the Treatment of Concomitant Convergent Strabismus - - - - - - - - 228

The Presence of Fine Opacities in the Vitreous. James W. Barrett and P. S. Webster - - - - - 229

Rhinitis Chronica Atrophicans Fœtida. T. K. Hamilton - 231

Discussion on Rhinitis Chronica Atrophicans Fœtida - . 242

Chronic Glaucoma. T. K. Hamilton - - - - 243

Pterygium. A. C. Purchas - - - - - 248

Operations on the Mastoid Process in Connection with Suppurative Disease of the Middle Ear. A. J. Brady - - - 249

The Ætiology of Episcleritis. W. M. Stenhouse - - - 251

Ante-natal Adenoid Growths as a Cause of Deaf-Mutism. W. M. Stenhouse - - - - - - - 253

Mania after Extraction of Cataract. H. Lindo Ferguson - 256

Aniridia—High Hypermetropia—Compensating Partial Cataract. J. Lockhart Gibson - - - - - - 257

SUB-SECTION OF DISEASES OF THE EYE, EAR AND THROAT *(Continued)*—

PAGE

Forward Dislocation of Lens—Traumatic Myopia—Retention of Accommodation. J. Lockhart Gibson - - - 258

On Examination of the Nares in the Routine Investigation of Various Local and General Diseases. W. G. Scott - - 259

SECTION OF PUBLIC HEALTH—

President's Address—The Battle of Life. J. W. Springthorpe - 267

Some Old Truths about Rural Sanitation. James Mason - 276

On Examination of a Potable Water from a Bacteriological and Chemical Point of View. A. G. Kidston-Hunter - - 285

The Public Health Aspect of Alcohol. W. A. Chapple - - 291

Discussion on the Public Health Aspect of Alcohol - - 300

Educational Problems Affecting Health. W. M. Stenhorse - 304

Insanity from Association, or *Folie à Deux.* H. C. McDouall - 307

Death Certification and Registration in New South Wales. G. L. Mullins - - - - - - - 314

On the Question of Finger Marks and Footprints in Medico-Legal Investigation. Harry A. de Lautour - - - - 317

SECTION OF MIDWIFERY AND DISEASES OF WOMEN—

President's Address. E. W. Way - - - - - 319

Design of Clamp for securing the Broad Ligaments in Vaginal Hysterectomy. J. H. Townend - - . - 327

Discussion on Clamp - - - - - - - 327

Puerperal Fever. A. J. Garland - - - - . 328

Discussion on Puerperal Fever - - - - - 329

Antisepsis Temperature—Rapid Dilatation of the Os during Labour. James R. Purdy - - - - - 333

Discussion on Antisepsis Temperature - - - - 335

Notes on Puerperal Eclampsia, with Special Reference to Urea Excretion. Wilton Love - - - - . 336

Discussion on Puerperal Eclampsia - - - - 341

Treatment of Retro-Displacements of the Uterus. Ralph Worrall 343

Discussion on Treatment of Retro-Displacements of the Uterus . 348

Three Cases of Broad Ligament Cysts. G. Rothwell Adam - 350

Case of Dermoid Cyst Coincident with Pregnancy. Robert Scott 352

Discussion; Thanks, &c. - - - - - - 354

SECTION OF ANATOMY, PHYSIOLOGY, PATHOLOGY AND PHARMACOLOGY—

PAGE

President's Address—The Study of Anatomy and Physiology. A. Watson - - - - - - - 356

Notes on the Innervation of the *Musculus Sternalis*, with Remarks on its Morphology. J. T. Wilson - - - - 358

Notes on the Stephanion, and on Various Descriptions of the Temporal Lines of the Skull. J. T. Wilson - - - 362

Notes on the Olfactory Centre. G. Elliot Smith - - - 366

The History of Twenty-nine Cases of Primary Neoplasms in the Kidney. H. B. Allen and T. Cherry - - - - 372

INTERCOLONIAL MEDICAL CONGRESS OF AUSTRALASIA.

FOURTH SESSION.

DUNEDIN, NEW ZEALAND.

FIRST DAY: MONDAY, 3RD FEBRUARY, 1896.

At 10 a.m. members assembled in the University Library for the purpose of entering their names on the Congress roll.

At 11 a.m. a GENERAL MEETING of members of the Congress was held in the Chemistry Class room of the University, Dr. F. C. Batchelor, President of the Congress, in the chair.

THE PRESIDENT thanked the members very kindly for the warm reception they had accorded to him. It was not his intention to make any lengthened remarks at that stage, for they would be more appropriately made later on in the day, but he felt it would be hardly gracious on his part to take the chair without attempting to express his heartfelt gratification at the great honour which had been conferred upon him in his election to the important position of President. One felt grateful for honour of any kind, but those honours which came from his professional brethren were, he always thought, the very highest which could be conferred upon a professional man, and they had conferred on him the very highest honour the profession in Australasia could confer on one of their colleagues when they elected him to that important office. He had great diffidence in accepting the position, but he trusted they would overlook his many shortcomings, and he knew that he could depend upon them for their loyal and kind support in helping him through any difficulties that might arise, and that they would help him to carry out to the best of his ability the most important trust they had reposed in him. Apologies had, the President went on to say, been received from a number of gentlemen who were unable to attend the meeting of the Congress. Among these were, unfortunately, the Presidents of two of their sections, Dr. Lendon, of Adelaide, who had found at the last moment that difficulties in connection with the Medical School, of whose Faculty he was the Dean, prevented him from coming, and Dr. Way, of Adelaide, who, he was sure they would all greatly regret to hear, was unable to be present owing to ill health; and Dr. Fitzgerald, of Melbourne, who was also prevented by ill health from attending. Certain deputies had been appointed by the various Governments. Dr. Springthorpe specially represented Victoria; Dr. Love, Queensland: Dr. Sprott, Tasmania; Dr. Lovegrove, Western Australia; and Drs. James and Brown, New Zealand.

REPORT OF EXECUTIVE COMMITTEE.

Professor Scott (Dunedin) read the following report of the Executive Committee:—

"At the Sydney meeting of the Congress in 1892 it was resolved that the fourth session should be held in New Zealand, and Dr. Batchelor, of Dunedin, was elected President. It almost necessarily followed from this choice that the place of meeting should be Dunedin, and indeed no other town has at any time been suggested. After consultation with the leading members of the profession in the other principal towns, Dr. Batchelor issued a circular to all registered practitioners in the Colony calling a meeting of those interested in the Congress. This was held in Dunedin on the 8th of May, 1894, and though for obvious reasons it consisted mainly of practitioners resident there, yet a number of letters containing valuable suggestions were received from medical men in other parts of the Colony, and due consideration was given to the views therein expressed. At this meeting the General and Executive Committees were elected; the former from among the practitioners in all parts of the Colony, the latter from those resident in Dunedin. Professor Scott and Dr. Barnett were elected the General Secretaries, and Dr. Closs the Treasurer to the Congress. A guarantee fund was also started. Since then small local sub-committees have been formed in Wellington, Auckland, Napier, Christchurch, and Invercargill, and these have heartily co-operated with the Executive in their efforts to promote the interests of the Congress. The Executive have been fortunate in again securing as local secretaries in the other colonies Drs. Muskett, Syme, Poulton, Sandford, Jackson, and Harvey. Dr. Drake found himself unable to act on this occasion, but Dr. Sprott, of Hobart, has taken his place, and he, like his colleagues, has spared no pains in discharging the duties of the post. The work of the Congress has been divided into the same five sections as at the Sydney meeting—medicine, surgery, public health, midwifery, and anatomy. Diseases of the eye, ear, and throat have, however, been formed into a special subsection of the section of surgery. A suggestion to form an additional section to be devoted to the consideration of dental questions was considered. The Executive, however, did not think that it came properly within its functions to decide this matter, and reserved its consideration for the full meeting of the Congress. As in past years the Governors of the various Australian colonies have kindly consented to act as patrons; and as far as possible precedent has been followed in choosing the Vice-Presidents of the Congress and in drawing up the list of Presidents and Vice-Presidents of sections. The Government of New Zealand have shown their appreciation of the value of these gatherings by granting to visiting members and their wives free passes on the railways. The Governments of the other colonies have similarly granted reduced railway fares, and the Governments of Victoria, Queensland, Western Australia, and Tasmania have also sent special representatives. To the Council of the University of Otago the Congress is indebted for the use of the buildings in which the meeting is to be held."

The President moved the adoption of the Report.

Professor Allen (Melbourne) had much pleasure in seconding the adoption of the Report, and thought the Congress might add their approval of the appointments made by the Executive Committee. The visiting members were much indebted to the Executive for all the trouble they had taken to promote the discharge of the business of the Congress, and also for the great trouble they had taken to promote the comfort and enjoyment of the visitors.

The motion was then put and carried.

A DENTAL SECTION.

The President mooted the desirability of adding a dental section to the Congress.

Dr. Springthorpe (Melbourne), as a member of the Dental Board of Victoria, remarked that it was partly with the idea of raising the status of dentistry that the proposal for the addition of a dental section was made. Nothing could, however, be done now, and perhaps the best thing would be to instruct the next Congress to take some actual action in the matter. He moved—"That the question of the establishment of a dental section be transmitted to the Executive Committee of the next Congress with power to take action in the matter."

Dr. Knaggs (Sydney) seconded the motion.

Dr. O'Hara (Melbourne) thought it would be an advantage not only to dentists in raising their standard, but also to the profession generally if dentists were admitted to the Congress as a section. He thought, however, that dentists should be brought to a certain standard before being admitted.

The motion was carried without dissent.

BUSINESS POSTPONED.

The President said the next business was the determining of the place and time of the next meeting and the election of the new President, but he thought it would possibly be best to defer until next Saturday the discussion on that point. This suggestion was approved of.

CONTAGIOUS DISEASES ACT.

Professor Scott (Dunedin) laid on the table a memorial from the Women's Christian Temperance Union of Victoria on the subject of the Contagious Diseases Act.

Dr. Springthorpe (Melbourne) moved—"That the memorial be referred to the Public Health Section." As President of that section he was prepared to undertake that it should be brought before the members.

Dr. Murray-Aynsley (Christchurch) seconded Dr. Springthorpe's motion, and said that other communications might be received from Christchurch.

The motion was then put and carried.

INTERCOLONIAL MEDICAL JOURNAL.

Dr. Barnett (Dunedin) said there was a matter he had been requested to bring before the Congress. The desirability of establishing an intercolonial medical journal was brought up at the last meeting of the Congress, and then referred to the present meeting. Negotiations had been proceeding in the meantime with the view of bringing about, if possible, the establishment of this federated journal, and he merely proposed to lay before the Congress the present position of affairs. The profession in New Zealand were very anxious to see an intercolonial journal. They had a small quarterly of their own, and they knew also of the *Australasian Medical Gazette*, the *Australian Medical Journal*, and the *Intercolonial Medical Quarterly*, but they were anxious to have one strong representative magazine for the whole of the colonies. It was felt to be impossible in the present state of science to keep up with current literature when so many journals were published, and it was the aim of the New Zealand practitioners to publish a New Zealand edition of an Australian medical journal on somewhat similar lines to those adopted in the magazine known as the Australian edition of the *Review of Reviews*, that being brought about by an exchange of sheets. He was sorry to say, however, that it was not in the least degree likely that that ideal could be realised, and Dr. Syme, the editor of the *Australian Medical Journal*, and Dr. Knaggs, the editor of the *Australasian Medical Gazette*, who were present, would probably indicate the objections to the plan. He believed that the *Australian Medical Journal* and the *Australasian Medical Gazette* were not likely to amalgamate, but the *Intercolonial Medical Quarterly* had already amalgamated with the *Australian Medical Journal*, and the publication was now known as the *Intercolonial Medical Journal*, so that there were now three journals — the *New Zealand Medical Journal*, the *Australasian Medical Gazette*, and the *Intercolonial Medical Journal*. The profession in New Zealand was now left with certain alternatives. One was to go on as at present; the second was to amalgamate with the *Australasian Medical Gazette*; and the third was to amalgamate with the *Intercolonial Medical Journal*, published in Victoria.

Dr. Syme (Melbourne) said the proposal for the exchange of sheets and the simultaneous publication of both an Australian and a New Zealand medical journal had been well threshed out from both the publishing and editorial points of view. The conductors of the *Intercolonial Medical Journal* would be only too glad if arrangements could be made to bring about an amalgamation of all the journals. He was very strongly of opinion, with Dr. Barnett, that it was highly desirable that they should have in Australasia one strong united journal, which would represent the whole of the profession, and carry weight not only in Australasia, but throughout the whole world, and he thought it a great pity that the material, which if collected would go to make up that journal, was scattered about over a number of comparatively poor journals. He suggested the establishment of an Australasian Medical Association as a step towards the solution of the difficulty, and indicated as objections to the exchange of sheets between the journals in Australia and New Zealand that there would be an awkwardness as to the literary form of the publication, a difficulty as to editorial control, and a considerable additional expense incurred in postage.

Dr. Knaggs (Sydney) regarded it as essential that a medical journal must belong to the profession, and not to other proprietors, and pointed out that the *Australasian Medical Gazette* was the property of the Australian branches of the British Medical Association. He was afraid that the postal regulations would be a great obstacle to the adoption of Dr. Barnett's suggestion that a New Zealand supplement should be tacked on to an

Australian edition; and another drawback was the uncertainty that would ensue as to time of issue of the journal. He strongly urged upon members to make up their minds to insist on having a journal which would be the property of the profession, and in the management of which each member of the profession would have some voice.

Dr. Jeffcoat (Dunedin) thought the whole of the discussion might be brought to a focus if the Medical Association would move the authorities of the British Medical Association to publish an Australasian edition of the *British Medical Journal.*

Dr. Colquhoun (Dunedin) observed that the scheme proposed by Dr. Jeffcoat was suggested by him to the general secretary of the British Medical Association when he was in England three years ago, but was received with coldness. He believed that the solution of the whole difficulty must lie in the formation of a strong Intercolonial Medical Association, which could, like the British Medical Association, and indeed should, possess its own medical journal. He would be inclined to go the length of proposing—"That a committee be appointed to consider the question of forming a union of the Australasian Medical Associations, and to report to next Congress."

Dr. Springthorpe (Melbourne) seconded the motion, and expressed the hope that the direction in which action would be taken would be in amalgamation with the *British Medical Journal*, with, however, an autonomy of their own, but in accord with that journal, their journal coming out with it.

Dr. Worrall (Sydney) characterised the action of the profession in New South Wales in purchasing the *Australasian Medical Gazette* as a unique sacrifice, and urged that that journal had first claim on the other colonies. The suggestion of Dr. Syme that there should be an Australasian Medical Association meant a multiplicity of societies and the disintegration and weakening of the profession. There were some of them who would never consent to sever their connection with the British Medical Association.

Professor Allen (Melbourne) counselled the wisdom of going on slowly, and moved as an amendment — "That the Congress again affirm the desirability of securing a fully representative medical journal for Australasia, and urge that negotiations to this end be continued and brought to an issue as speedily as possible, and that the Executive Committee of next Session be invited to give special attention to this and cognate matters."

Dr. Hayward (Adelaide) objected that the adoption of the amendment involved submitting the consideration of the question to an executive composed of members from one colony.

Dr. W. Brown (Dunedin) seconded the amendment, remarking that probably by the next meeting of Congress only the fittest of the existing journals would be surviving.

Dr. T. K. Hamilton (Adelaide) and Dr. Rabl (Murtoa, Victoria) supported the amendment, which on being put to the meeting was carried by 42 votes to 26.

The meeting was then adjourned until Saturday, the 8th inst.

THE MAYOR'S LUNCHEON.

At half-past 1 o'clock his Worship the Mayor of Dunedin (Mr N. Y. A. Wales) gave a luncheon in the Choral Hall to members of the Congress.

The chair was taken by his Worship, who was supported on his right by his Excellency the Governor and on his left by Dr. Batchelor (President of the Conference), the Hon. the Premier, and Major Elliott, A.D.C. Among those present were His Honor Mr Justice Williams, the Hon. Dr. Grace, the Hon. the Colonial Treasurer, Bishop Nevill, the Rev. Mr. Gibb, the Very Rev. Father Lynch, Mr. W. Hutchison, M.H.R., Councillors Dawson, Morrison, Haynes, Carroll, Hardy, Solomon, McGregor, the Chairman (Mr. H. Gourley) and members of the Harbour Board, the Chairman (Mr. J. Robin) and members of the Hospital and Charitable Aid Boards, the Chairman (Mr. P. Miller) and members of the Hospital Trustees, and representatives of other local bodies.

HIS WORSHIP proposed the toast of "The Queen," which was drunk with much enthusiasm.

HIS WORSHIP, in proposing the health of his Excellency the Governor, said that this might be considered a fitting time and place for him to give expression to a few words of loyalty, though he had no intention of saying anything that savoured of Jingoism or partook of undue excitement, and then went on to say: But these were perilous times, and rumours of war were afloat and war clouds were hovering over us. Though the masterful and manly diplomacy of Lord Salisbury and Mr. Chamberlain might fail to produce an amicable and honourable settlement of grave questions of Imperial policy it will be found that all parts of the Empire were prepared for the worst. I feel as an old volunteer that I voice the sentiments of them all when I assure your Excellency that every man is ready—that New Zealand will give the flower of her manhood and such means as are at her command to assist in maintaining the honour and prestige of the vast Empire of which we form a part. And while I make bold to proclaim our loyalty to her Majesty, I feel also that that loyalty is extended to her representative, Lord Glasgow, who so worthily and faithfully fulfils the duties of his exalted and responsible office. We may congratulate ourselves in these perilous times that we have at the head of our affairs a gentleman whose intimate knowledge of, and training in naval matters, may, added to his other many valuable qualities, be at such a juncture of inestimable value to the Colony. Recognising that this is not a strictly official visit, we have to thank his Excellency for honouring us with his presence on this occasion, and to express the hope that in making his first acquaintance with the beautiful scenery of our southern lakes and mountains, his Excellency and Lady Glasgow may not only have received delightful impressions, but also an accession of health and strength, which we trust may long be preserved to them. His Worship concluded by proposing the health of his Excellency Lord Glasgow.

LORD GLASGOW was received with an enthusiastic round of applause as he rose to respond. He said: Mr. Mayor and Gentlemen—Speaking, as I believe I do, to an assemblage composed to a very large extent of the medical men who have come to this city to attend the Congress, I think I may be allowed to congratulate those gentlemen on their not having entirely neglected in the course of their studies the science of music, and upon the obvious fact that they have taken care that the strength of their lungs has not been impaired. I beg to thank you, Mr. Mayor, most gratefully, and you, gentlemen, for the manner in which you have responded to the toast proposed by his Worship. And while thanking you for the cordial manner in which you have responded, I may confess that it has given me great pleasure indeed to be present on this occasion. In fact, if I may say so without anticipating the remarks I may have to make in another place— no, not "another place"—well, I am glad of the opportunity of saying what pleasure it has given me to be here to meet the medical men of the different colonies. I have had a good deal of acquaintance with medical men from my earliest years—in fact, I believe I may say that it was a medical man who first introduced me to my parents, and I may say I have known them ever since. From the early age of 12, when I went to sea, I have been messmates with them; I have met them in every phase of life, and they have sat upon me on several occasions. Of course I was rather down in the mouth when they did that, but the result has been to make me feel ever since a respect for the profession; and it seems to me that anything which promotes the interests of medical science makes for the general welfare of the community at large. Gentlemen, I thank you, and I shall not forget to inform Lady Glasgow of the strength of that cheer with which you responded to the mention of her name.

Mr. Justice Williams said that he had just been asked to propose a double-barrelled toast—viz., that of "His Excellency's Ministers and the Legislature of New Zealand." At first sight it might appear difficult to combine the two, but on consideration he did not think it was so, because, looking at the matter from the standpoint of an outsider, he did not think there was any considerable harm in it. He gathered from the newspapers that wherever his Excellency's Ministers decided to go there the Legislature decided to follow. He was sure this toast would be received on its merits and apart altogether from politics. It was manifest that the Ministry, from whichever side of politics they might be chosen, had in administering the affairs of the Colony a most difficult task to perform; and it must be admitted that the gentlemen who were at present occupying that high and honourable position, although some present might not agree with all their political acts, had brought to bear on the administration of our affairs diligence, attention, and devotion to duty. As to the Legislature, he had no doubt that a great many of our visitors had observed the wonderful vitality of the animal and plant life of this Colony, and our Legislature followed the analogy of that animal and plant life, because every year it turned out a very large volume of statutes—in fact, a very large amount of legislation took place every year. However, he supposed that was quite necessary. In New Zealand we had every reason to be proud of our Legislature—not only on account of its activity, of which he had made mention, but on account of the ability, great care, and assiduity with which it discussed every topic that came before it. He would couple with the toast the name of a gentleman whom they were very proud to see among them—the Hon. Mr. Seddon, the Premier of the Colony. However much some of them might differ from him, they could all respect his energy and devotion to duty. Henry the Eighth used to say that he loved a man. Well, he (the judge) could safely say that in Mr Seddon they had what his late Majesty would call a man—a very live man indeed. He concluded by proposing the toast, coupled with the name of Mr Seddon, and by calling upon the company to drink it with all the honours.

The Premier, in reply, said that when he glanced down the *menu*, and saw that there were to be no toasts, he prepared himself to enjoy his lunch, but when the Mayor quietly told him that this toast was to be proposed he replied that he was glad the notice was not given him before the lunch, because it would have materially interfered with his enjoyment of the repast. He could assure them that he felt nervous on this occasion, for he had been endeavouring to keep out of the hands of the doctors; and he could assure them, in respect to what his Excellency had said about having been "sat upon" by the doctors, that the longer he (Mr Seddon) could prevent that operation being performed on himself the better he should like it. He found himself on this occasion with medicine on his right and his military friend (Major Elliott) on his left, and he had been asking himself how politics and medicine would agree. But seeing the company he was in they had made a good start, and he thought they should get on very well together. This was not a fitting opportunity to go into questions upon which there would be differences of opinion. He took it that his Honor had been called on to propose this toast because it was the wish of those present to do honour to the Ministry of the day, to do honour to himself (Mr Seddon) and his colleagues, and to the Legislature of the Colony. He (Mr Seddon) accepted it as such, and was very pleased indeed to hear the wise words that fell from his Honor's lips. He was especially pleased to find the toast so well received by the company, because to a very large number of those present he (Mr Seddon) was a stranger, as were his colleagues. He took this opportunity of saying that the Ministry of New Zealand, on behalf of the people of this Colony, welcomed to New Zealand these men who made personal sacrifices and went to great expense in order to be present there that day, and whose sole object was to do good to suffering humanity. Now, politics were just a little mixed up with this question, and in this way: Twelve months ago Dr. Batchelor and other medical gentlemen waited on him, and told him that they had enjoyed the hospitality of the other colonies, and that great benefits had been derived from the Congresses that had been held in the other colonies; that it had been decided to hold a Medical Congress in New Zealand; and they asked him if his Government would be prepared to assist the movement. As a rule Governments—and he took it that his Government formed no exception—seldom made any definite promises, but he went this far: He said that the Government would do their best to assist the medical gentlemen—that if these gentlemen came over here from Australia there would be extended to the visitors that hospitality for which New Zealand in the past had been noted, and for which he hoped it would ever be recognised in the future. And he promised to give every encouragement to the deputation. He was very pleased to find that the medical men of New Zealand had, by their presence there, removed any doubts in his mind on the subject, for he had told the deputation that the medical men of New Zealand must show that they were alive to the advantages of the gathering and were prepared to assist it. And by way of helping the movement he had placed himself in communication with the other colonies and asked them to send over their medical representatives. And he took this opportunity of saying, although, of course, politics were not to be discussed at such a gathering, that the Governments of these colonies were working together—federating, in fact—for the purpose of having a successful Medical Congress in Dunedin. Now, Ministries might come and Ministries might go, but our Constitution—our grand old Constitution, which we all recognised and loved so well—would stand very much for humanity as it had always done in every part of the world. In that sense he, as the head of the Ministry, was heartily pleased at the reception which had that day been accorded to them. They were neither worse than nor as bad as some of the Ministries that had preceded them. It was the same with Ministries as with men: after Ministries passed away their virtues were extolled and their names and deeds blazoned before the world. To-day there had been an exception to this rule. Some of the deeds of his Ministry at all events had been recounted; he had been told that he was a man, and he was pleased to know that, as far as what his Ministry had been able to do, they had given satisfaction. Now, all this was very pleasing to him. At such a gathering, where men had met together with a common object in view, no matter what differences of opinion there might be among them—whether they were opposed to or supporters of the Ministry of the day,—it was exceedingly pleasant to see simple justice done to our public servants. He would conclude by stating, on behalf of the Ministry of New Zealand, that he hoped that his Ministry would ever do justice to the people of New Zealand, and at the same time do justice to the great natural advantages which this Colony possessed—advantages which he felt sure all our visitors would enjoy before they left our shores. It was for the good of the country that our people should be contented and intelligent, and whatever Ministry were in power they should strive to do justice both to the country and the people. He had only a last word to say—that he hoped that the same good feeling that existed at the present moment might ever continue.

THE HON. DR. GRACE responded on behalf of the Legislative Council.

HIS WORSHIP said he had one more pleasing duty to perform—in asking those present to do honour to one more toast. Whilst feeling that the toast was in itself a most significant and important one he would be very brief. He had to propose "The Medical Congress," coupling it with the name of its worthy President, Dr. Batchelor. The objects and aims of the Congress were well known to all and were most laudable, and there could be no doubt that to a great extent these were achieved by these frequent gatherings of the profession in the advancement of medical science and the employment of the most skilful and up-to-date methods for the relief of suffering humanity. It was not easy for men actively engaged in the duties of their profession in these colonies to visit the European centres often or in large numbers, and the need of such an association as the Congress was thereby rendered more urgently necessary. He had, on behalf of the lay community, to congratulate the association on the attendance at the Congress, and to wish that light might shine on, and success attend, all the deliberations with benefit to the members and the community at large. He desired also, on behalf of the citizens, to thank the Congress for the honour it had done Dunedin in holding this its fourth meeting here. He asked them all to toast the Medical Congress and the President, Dr. Batchelor.

DR. BATCHELOR, the President of the Congress, in replying on behalf of the profession, said:—Mr. Mayor, I thank you most sincerely for the very hearty manner in which you have proposed this toast, and also for the most hospitable manner in which you have entertained the members of this Congress. When it was first decided that this meeting should be held in Dunedin there were many among us who had considerable doubt whether we were not undertaking rather too ambitious a task, and whether it would be possible for a small community to carry out the Congress on the lines previously adopted. But, sir, for my part I felt well assured that this Colony, and the people of this city, would recognise the importance of this meeting and its relation to the public well-being as has been the case in connection with similar gatherings in all civilised centres throughout the world. The presence to-day of his Excellency the Governor, the Hon. the Premier of this Colony, and of the Hon. the Colonial Treasurer, shows that we have received the support I anticipated from those in authority; while you, Mr. Mayor, as representing the citizens, by inviting us here to-day, have shown that we may safely depend upon the support and co-operation of our fellow-citizens. Possibly it would be well before referring to some of the advantages that accrue from these Congresses to direct attention to what I consider to be a rather popular fallacy regarding them. It is this: The public naturally understand very little of the character of our work, but they see and take a great interest in the social festivities at these meetings, and are therefore readily inclined to believe that these Congresses are a kind of huge medical jollification, and that members meet here simply for their own enjoyment. Any such impression is entirely fallacious. But, sir, when we remember that many of our visitors have come here at very great loss and inconvenience—that they have had to put up with the discomforts and misery of a long sea voyage, travelling thousands of miles to attend this Congress,—it would be churlish, indeed, of us (their hosts) if we did not use every means in our power to make what spare time they have at their disposal as enjoyable and as interesting to them as possible. This has been the spirit that has actuated Congresses of this kind in the past. It is the spirit that is actuating us now, and I trust and hope it will actuate those connected with all future Congresses. Of course it is excessively difficult to convey to the laymen any accurate impression of the character of the work transacted at these Congresses. Possibly what would best appeal to them would be to refer them to our voluminous transactions, which at the last Congress in Sydney and at the preceding one in Melbourne formed bulky volumes of 700 or 800 pages each. Much of the work then done I have no hesitation in saying was of the very highest quality. At our present meeting we shall devote some twenty hours to strictly professional work; but it must be remembered that these twenty hours' work represent the condensation of labours and observations and the researches of individual members not to be calculated by hours or days, but by months or years, or it may be even the experiences of a lifetime. These are brought before us for professional criticism and review, and every new fact elicited, every error dispelled, is a direct advantage to ourselves and indirectly again to those to whom we are called upon to minister. Then, sir, there is a section of our work which every medical man may speak of with pride. It is work of a character which is done by no other public body of men and no other profession that I am aware of. I refer to the work done in our section of public hygiene, which forms one of the five sections into which our work is divided. Here our labours and our deliberations are to devise measures for the prevention and arrest of disease. It is an attack upon those very conditions on the existence of which we depend for our livelihood. This is work which I consider the very essence of philanthropy. Here, too, I might refer to the fact that at previous Congresses it has been usual to devote one morning to the discussion of some special subject of great and general interest to the whole body of the profession. I might perhaps refer to the Congress held in Melbourne in 1889, when the subject of hydatids, a disease very prevalent in these colonies, was under consideration. I venture to state that as a result of that discussion our knowledge of the subject has been most materially increased, and our methods of treatment enormously improved. On the present occasion we propose to take up the subject of tuberculosis, the most protean, many-faced, and generally disseminated of diseases that afflict mankind. We have called to our aid our veterinary *confrères*, who we hope will aid us in our deliberations. It must not be expected that any startling results will immediately follow from the discussion, but what we might hope to do is so to focus the knowledge we do possess as to have a surer basis from which to start, and thereby we may hope ultimately to devise such measures as will assist in mitigating this the greatest curse of our modern civilisation. But, sir, there is still another factor at work which is after all the most powerful for good in connection with these meetings. It is a very subtle, very imponderable one. I mean that wonderful action and re-action of mind on mind, whence spring fresh zeal, new energies, and increased enthusiasm. Many a man comes to this meeting worn and jaded with the toil, the drudgery, and monotony of practice, and returns from it to his home with fresh energy and renewed vigour. And, sir, at the risk of appearing a little egotistical, I cannot refrain from making reference to a result that accrued from a Congress that some of my friends probably may remember. I refer to the Congress held in Melbourne in 1889. My colleagues and myself, when we saw the work that was being done by our *confrères* in that city, when we saw their hospitals and other appliances, we returned to this Colony imbued with the idea that our hospitals in New Zealand were not in line as they should be with the Australian hospitals. This was particularly the case respecting the hospital in this town, and we determined to make a vigorous effort to arouse some interest in the reforms we saw were so urgently needed. You will remember, sir, the controversy that ensued. That controversy, sir, was but the surf that marked the advancing wave of progress—a wave that has converted this hospital from an institution of which we were ashamed, to one which we can now ask our Australian colleagues to visit, with the full assurance that they will find us well up to the times, and although possibly it will not compare with their magnificent buildings, still they will find the institution one in which as good work can be done as anywhere in the world. This has not been confined to Dunedin only, but I venture to say that during the last six years every hospital in every large centre in the Colony has profited by that movement. I visited those hospitals six years ago, prior to my visit to Australia, and I visited them again on my return to this Colony recently, and I do say that throughout the Colony there has been a wonderful change for the better. But clearly understand me upon this point: I do not wish for one moment to claim more than we deserve. I say that the stimulus, or initial velocity if you will, for that reform originated in the Melbourne Congress, and the work has been subsequently carried out by entirely other hands. Those gentlemen who have carried out this work have not, I consider, received from the citizens of this town the meed of praise they have merited. The work has been done in the face of great difficulties, with much patient labour and persistent devotion, and if I might refer to one gentleman who I think is pre-eminently deserving of praise—although it may possibly seem a little invidious to single out one where so many have been doing such good work,—I would wish to name our worthy chairman of the Hospital Trustees, Mr. Peter Miller, who, by his pluck, determination, and indomitable perseverance, has carried these reforms to so successful an issue. I am afraid that

I am trenching upon your valuable time, but still it is not often I get an opportunity of speaking from a position such as I hold here to-day, and I will ask your permission to refer to a matter of local interest. This city of Dunedin, some few years back, prided itself upon being the centre of commercial activity and prosperity in New Zealand. I think we must confess we have of late years lost that position; but, sir, I am one who does not believe that commercial success is the only form of prosperity a community can enjoy. I think there are other forms of prosperity that equally tend to the happiness and well-being of a community, and, sir, the spirit that actuated the pioneer fathers in this province was, I believe, a desire to make this city of Dunedin a centre of intellectual and educational activity. I believe that spirit still survives amongst us, and as an evidence of it I would point to the existence of our Medical School. This school has not received the recognition that is due to it from this town, or this province, or this Colony. I do say that a medical school in our midst must prove of enormous benefit to our people. It is impossible in the time at my disposal to dwell long upon this subject; but there are two points to which I will specially refer. One is the fact that it offers the means of entering a useful and honourable profession to a number of young men who otherwise would be entirely debarred from it. In the second place, and this I do not think is generally recognised, I say that the school in our midst must tend to raise the general standard of excellence of the whole profession, not only in this town, but throughout the Colony. To be a teacher one must know his work, and know it thoroughly, and if the medical men in this town know their work and the medical men of our neighbouring towns do not keep so well up to date, the fact will be very soon recognised by their patients, and they will come to us here in Dunedin for treatment; but, sir, our medical colleagues in Christchurch and in Wellington do not care to have their patients come to Dunedin for treatment, and were I a resident of either of those cities I should, no doubt, very strongly object to my patients going elsewhere. The result must follow that our friends must and do keep up their work, and that generally a higher standard of excellence is consequently maintained. Sir, it does seem to me a rather anomalous condition of affairs that in a country like this, where such a lavish expenditure is devoted, and rightly devoted, to elementary education, no State assistance whatever is granted to the development of an institution which is of the highest import to our whole community. In European cities a large number of medical schools are entirely State supported, and I do think that here we might reasonably ask some aid from the Government to enable us to provide for the growth and development of our Medical School, which at present urgently demands assistance. Then, too, sir, I think, with regard to our local bodies, we may expect from them the exhibition of a more liberal spirit in their relations with our school. Very shortly, I believe, we may expect an alteration in our Municipal Act, and I trust that our local bodies will themselves urge upon the Government the necessity for making such provision as may be necessary for the satisfactory conduct of our school. I shall not detain you longer upon this topic, as I propose to refer to the matter again at greater length to-night, but will conclude by saying that if the meeting of our Congress should arouse sufficient enthusiasm and public spirit to create a more liberal and enlightened policy, whereby our means of sustenance may be augmented, and an extension may be secured, of those privileges which are at present too strictly guarded by the local bodies, then our present Congress will have deserved well of this town and well of this country.

The gathering then terminated.

In the afternoon a garden party was given by members of the Dunedin Club in honour of the Congress. Amongst those present were his Excellency the Governor, Lady Glasgow, and Mr. Seddon, the Premier of the Colony.

OPENING CEREMONY.

The inaugural ceremony in connection with the meeting of the Congress was held in the Choral Hall, and proved a brilliant function. The hall was crowded with ladies and gentlemen, among those present being nearly all the members of the Congress. The other learned professions, the Legislature, and the local bodies were also largely represented in the assemblage. Shortly after 8.30 p.m., the hour fixed for the commencement of the meeting, Lord and Lady Glasgow arrived at the hall, where they were received by the President. The Otago Hussars formed a guard of honour to His Excellency as he drove from the Grand Hotel to the hall. Warm applause greeted the Governor as he steeped on to the platform, and a similar welcome was accorded to Lady Glasgow, the President and Mrs. Batchelor, and the members of the Ministry. His Excellency the Governor filled the chair, and seats on the platform were occupied also by the Countess of Glasgow, the President of the Congress (Dr. Batchelor), Mrs. Batchelor, the Premier (the Hon. R. J. Seddon), the Colonial Treasurer (the Hon. J. G. Ward), His Honor Mr. Justice Williams, Dr. Love (representing Queensland), Professor Allen (Melbourne), Dr. O'Hara (Melbourne), Dr. Springthorpe (Melbourne), Professor Scott, the Hon. Dr. Grace, M.L.C. (Wellington), His Worship the Mayor (Mr. N. Y. A. Wales), Major Elliott, Captain Preston, Dr. Barnett, and Dr. Closs.

THE PRESIDENT: I have to ask His Excellency the Governor to declare the Congress open.

HIS EXCELLENCY THE GOVERNOR, who was received with cheers, said: Mr. President, ladies and gentlemen,—Before saying what it is my pleasing duty to say, I beg to express my most unfeigned pleasure in being able to come here to-night to do what is in my power to show my appreciation of the work which is to be done at this Congress, and to do it what honour I can. Ladies and gentlemen, it is my first and most pleasing duty to offer, on behalf of myself, as Governor of this Colony, and on behalf of New Zealand, a most cordial welcome to all the members of the Congress who are here assembled, but especially to those members who have crossed the stormy ocean to come here on this occasion. I believe that you are, nearly all of you, aware that this is one of a series of Congresses which have been held during the last few years in Australasia. The first was held in Adelaide in the year 1887, the second in Melbourne in 1889 (the year of the great exhibition there), the third was held in Sydney in the year 1892, and this is the fourth of the series. I believe, Mr. President, that you to-day in your remarks stated the reasons which caused you to be pleased with the number of the members who have appeared to take their part in the deliberations of this Congress, but there may be some here who are not aware of the reason why it is not to be expected that in New Zealand we should be able to have such a large number of medical men present in the Congress as has been the case in former Congresses in Australia. I may point out that Dunedin is a town of 40,000 inhabitants, whereas Melbourne is a town of nearly 500,000 inhabitants, and Sydney of 450,000. You will understand that there are not so many doctors in Dunedin as there are in those great towns, but even if there was not that great reason why there should not be such a large assemblage here, when we think of the stormy water which has been crossed to come to New Zealand we know it is sufficient to daunt a great many hearts. We are therefore very glad indeed to welcome those medical men who have come from the Australian Colonies to be present on this occasion. Ladies and gentlemen, we know not only the terrors of that crossing, but we are also glad to know that that crossing not only did not daunt many of those who are here present, but that some landed on the West Coast and made their way across the island through the Lake country, showing thereby a superabundance of energy, the remainder of which I hope they will spend in doing the work of this Congress. On behalf of New Zealand, I may perhaps be allowed to say that it gives us great pleasure to think that so many medical men have come over and have paid this visit to our lakes, because we feel sure that when they return to their country they will say there is no place where it is more delightful to spend a hot summer than in the lake country of New Zealand. Ladies and gentlemen, I think the medical profession of Australasia are to be congratulated upon having formed this corporation, if I may use the expression, of having undertaken to meet together in this series of Congresses as they have been doing for the last few years. This nineteenth century is a century which is remarkable for many things. I think among other things it is remarkable for being a century of Congresses. On every possible subject people meet together and talk it over, and there can be no possible doubt that in all scientific bodies it is of the utmost use that the members should meet together and talk over the subjects in which they are interested. We all know that this is the case with the Royal Society at Home, and with the different associations connected with science, and we are to be congratulated on the fact that the great medical bodies in these Colonies are not behindhand in taking an interest in their work, but have met in the same way as they do at Home for the purpose of talking over the work in which they are engaged. They have met every three years to take stock, so to speak, of their work—to go over the work that has been done during the preceding period, to consider all the new inventions and new discoveries that are made in medical science, and by means of these discussions and deliberations to see their path clear before them for the work they have to do in the future. It is for these reasons, ladies and gentlemen, that I think we are to be congratulated upon having in Australasia such a number of able medical men who are able not only to do their work but to look forward to the future, and in every way possible to fit themselves for the work which will come upon them in times to come. Ladies and gentlemen, I think it is hardly necessary for me to assure the members of the Medical Congress of the interest which the public of New Zealand take in their work. I do not think there are many medical men in the world who are fitted to do their work if they are not the friends of those among whom they practice. You are all centres of groups of friends, and it is through your friendship with them that you are able to do your work efficiently. It is because in this Colony, as in others, we are well acquainted with the usefulness of the work you are here to do and the way in which you do it that we heartily show our interest in the work you have assembled to do, and wish you Godspeed in it. You have not come here, ladies and gentlemen, to-night to hear an address from me, although I think in one of the papers it was said that I was to deliver the inaugural address on this occasion. I can only in a few words—the best which I can muster—express our feelings of welcome to you on this occasion, and perform the duty, which I now beg to do—that is, Mr. President, to declare this Congress, the Intercolonial Medical Congress of Australasia, open, and to wish it Godspeed in its work.

The President requested the Premier to address a few words of welcome to the visiting members of the Congress.

The Premier, who was received with loud applause, said: Your Excellency, Mr. President, ladies and gentlemen,—It is with pleasure that I respond to the call of the President. I regret, at the same time, that it has not been left in abler hands than mine to accord this welcome to our guests. Permit me, ladies and gentlemen, to say this: that I should be wanting in my duty to the people of New Zealand and to the people here assembled did I not, to the best of my ability, accord our visitors that welcome they are entitled to. When, some time ago, this was first mentioned to me, when a deputation waited on me to ask what assistance the Government would lend to the Congress, if held in New Zealand, I considered it to be my duty, simply as a representative of the people and the State, to say that we should do here in New Zealand what had been done in the other Colonies, and in the interests of all endeavour to help those moving in the matter to bring it to a successful issue. It was thought at the time that that was a very large order. His Excellency the Governor has told you that the configuration of our country and the settlement of its people differ widely from that of Australia. You might say, practically speaking, that Melbourne represents Victoria. There is very little difficulty in the way of medical men meeting in Melbourne. There is very little difficulty in the way of medical men from other colonies getting to Melbourne. The same thing would apply in every case to New South Wales and I think that, seeing the difficulties—the time that is entailed by travelling the long distance, and the time needed to do justice to the subjects brought under the notice of the Congress—those who have come here, who have spent this time and gone to this expense and inconvenience to be here are doubly welcome, and that the Congress is in every sense of the term a success. We must not forget that New South Wales — our parent colony — is here, at this Congress, represented. Victoria, Queensland, and Tasmania are also represented. Sir John Forrest informed me by telegram that the chief medical officer of Western Australia will be present at this Congress, but I regret to say that so far that representative has not arrived. Probably the absence from the Congress of medical men from Western Australia may be easily accounted for. The large influx of population, the attractions of the goldfields, and the necessity of attending to the sick, have probably prevented some of the medical men of that part from leaving there. But we are glad indeed to find so many medical men, representative men of their profession from the whole of the colonies, here in New Zealand. I say that this is a federal movement. It is a federation which must prove beneficial to all concerned. I say that there is no object so worthy as that for which these gentlemen are gathered together in our midst—representatives of medicine, surgery, dentistry, and public health—and they are here banded together to alleviate as far as they can, suffering and the sufferings of humanity. I say that nothing should so far commend it to our good wishes as the fact that they are here for that purpose; and I am sure that you here, and every well-wisher of the Colony, will join me in extending to them a most hearty welcome. I feel myself that our country will benefit in many ways by this visit. The master minds of the profession here in Congress assembled will go into many subjects which will be brought under their notice, and there will be a beneficial result therefrom. We must admit that, as has been stated by his Excellency, great progress has been made; but we know that there are men in the noble profession to which I allude who month after month—nay, year after year—are studying. Experience is teaching, and from that experience they are learning; but there is doubt; they hesitate; they must have the assistance of others who have probably been also studying and experimenting. Now the opportunity is given at the gathering of such a Congress as this, and master minds are brought to bear upon the experience—upon the study of the medical man who has been so experimenting, and we shall find that as the result of it much benefit will be derived from the study of this noble work. Then, again, I say that in a country such as Australasia we should be brought more in touch with each other. There are very many in New Zealand who have not the opportunity of visiting the other colonies. There are many in the other colonies who do not know that New Zealand is the beautiful and attractive country that it is, and when these gentlemen return to Australia and find, as they will, that some of their patients are suffering from the effects of the excessive heat we have been reading about during the last few weeks, they will no doubt, in the interests of the patients, recommend a change. and send them as near as possible to Mount Cook. I do not wish to say too much for our country; it speaks for itself; and if the gentlemen from the neighbouring colonies—our visitors—will only take the opportunity to see as much as it is possible for them to see within the limited time at their disposal, I am satisfied that they will go back favourably impressed with our country; and let us hope, ladies and gentlemen, that they will be favourably impressed with the people. I do not think I am stating that which will be denied when I say that New Zealanders are hospitable people, and I hope that the ladies and gentlemen of Dunedin will not think I am flattering—because I never flatter—when I say that if there is one place in the Colony above all others where the people vie with each other in extending hospitality, it is Dunedin. Mr. President, I think I could give ample proof of that, and so could every one of our visitors. The only fear that I have is this: that when the Congress is over, and our medical visitors have left for their homes there will be a considerable amount of work to be done by our local medicos. But. ladies and gentlemen, you are doing that which New Zealand would look for you to do; and I am sure that the President and those who decided that the Congress should be held here in Dunedin, knew that they would have the support of the ladies and gentlemen of the place; and relying on that support, no doubt, they were encouraged to ask that the Congress be held here. Now there are other ways in which our visitors may learn a little. They are now in a country in which the franchise has been extended to the ladies. I have heard from some of the visitors that they had wanted to see New Zealand. They had heard a great deal of it—that we had many things which do not obtain in the other colonies, that we had indulged in what are regarded as experiments—and they were curious to see how a country was governed where the ladies had a voice in the Government. Well, I was somewhat amused to read that a memorial has been sent by the ladies to the Congress, and I thought, under the circumstances, that the ladies who sent that memorial relied on their sisters in New Zealand to assist them in the cause they were bringing before the Congress. I hope our visitors will not leave our shores without going to see the beautiful inland lakes of Otago, otherwise they would have missed a treat which may not be open to them again. A few, it is true, have come over from Milford Sound to the lakes, and have seen the country as many in this room saw it when they first arrived on its shores. They also saw, as they came from the lakes down here, what has been done by our people in a very few years. Then again they will find if, after visiting that part of the country, they will go to—shall I say, the West Coast of the Middle Island—there they will see our beautiful gorges. They will see the scenery, beautiful and sublime, which is to be seen as one passes through the Otira Gorge, and they will see the rock-bound Buller Gorge. Then I would advise them, in going to the North Island *via* the West Coast, to see Nelson, and proceed thence to Wellington, and thence go on through the North Island to the wonderland of the hot lakes—Rotorua and Te Aroha. There again it would be interesting to them as well as instructive. In all probability many of our visitors will contrive to visit the places I have indicated, and shall I say that wherever they go they will find a hearty welcome will be extended to them. They will find that every assistance which the authorities can give them to make their visit pleasant as well as profitable will be cordially given. I will say nothing further than this—that it gives me very great pleasure indeed to ask you here, on behalf of the Colony, to give a hearty welcome to our illustrious guests, because they are good and true men who have come here in the good work in which they are engaged.

THE PRESIDENT'S ADDRESS.

THE PRESIDENT, who on rising was greeted with loud applause, spoke as follows:—May it please your Excellency, ladies and gentlemen,—The present occasion is auspicious as being the first time that the medical men of Australasia have convened for the purposes of a Congress within these islands. I should be deeply insensible were I not to endeavour to express my thanks to my professional brethren for the distinguished honour conferred upon me by their election of me to act as your President on this inaugural occasion. It was my great privilege and pleasure to attend the Congress held in Melbourne in January 1889, where the charge of one of the sections was deputed to me. I took care to notice during that Congress how very few New Zealand men were in attendance, and it seemed to me a matter for regret that this Colony was not more fully and adequately represented. Our Australian colleagues, I felt, could not know, as they had no means of knowing, what were the nature and spirit, the resources and capabilities of the profession in New Zealand; they could form no estimate how wide was the area of choice among highly competent men should they be casting about for a man to preside in a New Zealand Congress, and that being so I have no doubt the main cause is before you why their choice fell upon myself. I am in any case profoundly sensible of the distinction that has consequently fallen to my lot. I have now much pleasure, in the name of the profession in this Colony, in welcoming to New Zealand all the visitors who have ventured across the seas to join us within these walls. I welcome all our colleagues from other parts of these islands, and more especially do I welcome His Excellency the Governor and the Premier of the Colony, who have done us the honour of being present here to-day. Nor am I inclined to allow to escape from your attention that we are welcoming you to Dunedin. The deliberate choice of the profession of New Zealand fell upon Dunedin as the place most suitable for the Congress. Here is situated our national Medical School, and all the accredited public teachers of medicine are collected in this town. There may be other reasons, good and sufficient in themselves, why this town is prominently suitable for a congress of this kind, but the final reason is the choice of the profession in New Zealand. In welcoming you, then, to Dunedin, I would venture to remind you that as a town it has not what I may call the carrying capacity of the great Australian centres. We may not hope to vie with your great halls in Sydney and Melbourne, nor with your clubs, nor with any of your means of public festivity and entertainment. Hospitality, therefore, on the large and public scale it is quite hopeless for us to attempt, but we will do our best to entertain and amuse you short of these effective means, and what we may lack in efficiency we are going to try and compensate in goodwill. It has always been, among us here, a matter of grateful remark with how much effusion and kindness our New Zealand men are welcomed when occasion calls them to visit Australia; for myself, I have found your hospitality profuse and splendid. I am confident many of my medical friends will bear me out by a similar experience, and will join with me at this juncture in thanking you for more than fraternal kindness, both on the occasions we have visited congressional meetings on your continent, and when we have reached your shores in our private capacity. At the same time allow me to hope that your own efforts and adventure in coming here may not be without profit to you, merely as visitors or travellers. New Zealand is a country much talked about in Australia, is too seldom visited by Australians, yet we think there is a great deal that will repay the toil and discomfort involved in crossing the stormy Tasman Sea to visit these shores. The scenery of New Zealand, if not unrivalled, is at least very magnificent; there is a large range of climate, which is equivalent to the varied conditions noticed by a traveller who should journey from London to Algiers by way of France and Italy; nature may be seen either in her sublimer, her milder, her fantastic, or grotesque moods, according as you visit our cold lakes, the plains of Canterbury, or the volcanic region of the northern province. Where the Government system of railways leads, you are, by the indulgence of our Premier and the Minister for railways, permitted to travel free. As to our other arrangements, I trust the programme in your hands may be found satisfactory both as to variety and fulness. You will, I have every reason to hope, take away with you impressive memories of New Zealand, if you can find time and opportunity to visit what she has to present. I may be pardoned for being a little expansive on this point, as it is not claimed that we have been operative or assisting in the production of the splendid natural features of our country. It is now time for me to pass on to the subject of this Address. In reviewing the numerous topics that fairly come within the field of a President's consideration I have endeavoured, both as to choice and treatment of the subject, to follow the example of the men who have virtually preceded me in this or kindred offices, and have selected a topic that I think may be handled without degrading it in a popular style, because of its importance to the public welfare. I will for a short time submit for your consideration some thoughts connected with the "Present and Prospective Conditions of Medical Education," with applied reference to the requirements and drawbacks of Colonial life. The question is often asked,

IS MEDICINE AN EXACT SCIENCE?

Medicine cannot be an exact science until all the thinkable relationships of cause and effect in connection with the human frame are clearly indicated and understood. It is not pretended that as yet all the normal physiological functions, the whole of the changes induced by disease or the exact nature of the action of many drugs upon the tissues of the body, are fully apprehended; but whatever defects there may be in many details of medical practice—if you will allow me most briefly to review the additions and developments in medical knowledge during the last quarter of a century—you will, I trust, agree with me that science has won from empiricism many tracts of action, over which, in no very remote past, the latter reigned supreme. I think that such a review, however incomplete, will strike the imagination with a force not so great in degree, but similar in kind, to the effect produced by that address of Sir Douglas Galton, as president of the British Association for 1895, in which he took occasion to direct the attention of his audience to the additions made during the previous forty-five years to the empire of scientific knowledge and action. Such a review is also essential to my main contention that, having regard to the scientific advance within the sphere of medical practice during the last twenty-five years, the time has come for a general reconsideration of the earlier stages of medical education.

DEVELOPMENT IN USE OF INSTRUMENTS.

(*a*) First permit me to draw attention to certain instruments of scientific precision that have come into accepted use by the general body of modern practitioners. Take the clinical thermometer. Now, in a certain way, the clinical value of the thermometer has been known since 1740—Joseph Hunter knew it and used it, while Laplace and Lavoisier had made extended reference to it a century ago—yet it was not until Wunderlich's book on "Medical Thermometry" was published, and its translation by the Sydenham Society in 1871 became generally known, that the practical attention of the English-speaking race to the extreme value of thermometry in disease was secured. At this day it is well known it is a part of the common furniture of every sickroom. All our nurses constantly use it; while any person, not of the feeblest or most untrained intelligence, can be taught in a few minutes how to observe and how to record its information. What is the inner meaning and warning of the thermal record it is for the medical men to decide and act upon, but the advantage to him of having a thermal chart kept with fidelity is inestimable. (*b*) Pass we now to another instrument, equally simple in structure and unerring in record, the stethoscope. Laennec's instrument of 1819 has been well known to members of the profession who please themselves with some dalliance with medical history. But for a long time the stethoscope was looked upon in many quarters as a fair subject of professional jocosity. There is a well-authenticated story of an eminent physician who for a time wore his stethoscope in his top buttonhole, as a kind of fadeless flower untouched by stain of time or decay. The elder men of the sixties, if they sported a stethoscope at all, wore it in their hats in company with a silk handkerchief. More often than not the hat with these contents was left in the ante-chamber of sickness. Yet no medical man now ventures abroad without it, while its use has been extended beyond all range of previous anticipation. The heart is a pump, and the blood is a fluid. What more scientific in spirit than to observe the beats of the one and the flow of the other? The clear, sharp, rhythmical sounds, the wheezy swish of impeded action, the disorderly recurrence of beat and flow tell their tale to the trained ear. These and similar phenomena, carefully traced and recorded, constitute for the heart and the pericardial region a mass of facts which, while they are signs of cause and effect, bring the whole subject of cardiac affections within the scope and range of an exact science. *(c)* Directly allied to the stethoscope is the sphygmograph. This instrument gives a visible and permanent record, which can be studied and kept for reference, of movements which had previously to be estimated by the sense of touch alone, and many of which were too fine for appreciation. There may yet be a stethoscope that by some application of phonography shall succeed in recording in graphic form the information transmitted to the ear. Then will the stethoscope and the sphygmograph stand in the same class for effective record. Meanwhile, in therapeutical investigation the instrument has become indispensable as a means of discerning the influence exerted, in any state of the transmitting vessels, on the conditions of peripheral circulation, and on the vigour of the heart. Few things strike the imagination more than the action of this instrument, which graphically represents some of the most intimate suggestions and significant phenomena of the circulatory system. The highest skill of touch that ever marked a pulse is mere blind groping compared with this instrument, which converts into permanent record transient conditions of life history. *(d)* Let me proceed in this hasty review to call attention to the wide development in the use and application of the microscope during the last 25 years. In my day in London, students were little trained in its use; the instrument was prohibitive as to price, while the article available was not very serviceable; now every student receives courses of instruction in microscopy. No medical man may now venture to dispense with it. What would be thought of one who would make his prognosis on Bright's disease, or his diagnosis in various derangements of the kidney secretion, without recourse to the microscope? What reliance would be due to his judgment? Similarly in skin diseases. In the diagnosis of doubtful tumors, in the examination of various discharges and secretions, the revelations of the microscope are in every way of the highest import. What, too, of the numerous complaints and diseases that are now referred, and of the ever-increasing number of diseases that in the near future will be referred, to bacterial origin? In this direction the services of the microscope are already indispensable; yet who will venture to deny that in this field of work the application of microscopy is rapidly undergoing a vast and unforeseen development? Among the most interesting and neatest scientific instruments used in conjunction with the microscope for our work, let me mention the hæmacytometer. What can be more remarkable than its simplicity and accuracy? By means of coloured solutions we arrive with facility at the exact proportions of the most important constituents of the blood: the unit value of each blood cell may be estimated, the record of which may be kept as an exactly observed optical analysis; in fact, it gives us a pictorial account from day to day, if you will, of the fluid whose validity and quality lie at the very base and springs of life. Time does not permit of any lengthy reference to many other instruments that will suggest themselves: our appliances for testing the re-action of nerve and muscle to the galvanic currents—the spirometer, the urinometer, dynamometer, and others. All have one characteristic in common—they replace the personal by the scientific standard of observation. Then, too, the recent expansion in certain special departments of our art has been largely owing to the aid afforded by such instruments as the ophthalmoscope and the laryngoscope, supplanting, as they do, empirical treatment by methods based on actual observation. The importance and scope of the advance in these branches may be best estimated by the number of highly-trained specialists in all quarters of the globe who devote their energies solely to the treatment of these organs.

ADVANCES IN MEDICAL SCIENCE.

(*e*) Let me now pass on to chemistry to exemplify some of the most striking and extensive advances in the medical science of the last twenty-five years. Chemistry has become the docile handmaid of medicine in respect to a vast and increasing array of physiological, pathological, and therapeutical processes. Take the instance of the liver, the largest and most important gland in the body, as it is perhaps the best known to popular literature. But a few years ago the liver was in many polite circles the most inexhaustible of all conversational topics. No respectable man, especially the man of Oriental experience, might dispense with much reference to his liver; he often spoke of himself as having none; still more often he spoke of himself as being all liver. In fact, the liver was, as the late Milner Fothergill quaintly remarked, a sort of no man's land—a kind of *terra incognita*—the dark, mysterious, untravelled continent of physiology. For centuries vague views, untouched by any light of science, of the functions of the liver prevailed; in fact, the general opinion of the profession with regard to these functions may be summarily referred to as—bile! It was in the Croonian Lectures in 1874, before the Royal College of Physicians, that the late Dr. James Murchison took the whole of the profession by storm. Murchison, as he himself fully acknowledged, owed much to his immediate predecessors, and to the indefatigable Claude Bernard, who, as *facile princeps*, did between 1868 and 1874 such excellent work on the physiological chemistry of this gland. Murchison in his lectures pointed out that the liver is a large, energetic, and industrious centre of chemical action. He explained the true import of the glycogenic function: how the liver breaks up and reconstructs albumenoids, forming urea and other nitrogenous products, which are subsequently passed by the kidneys, and how it generally operates in most important metabolic food processes, while he unravelled for the first time the true relationship between lithiasis, gout, gravel, and kidney disease. He showed how these results had been worked out by an exact chemical analysis, without which correct knowledge of the subject is impossible. Later still, Sir William Roberts (Lumleian Lectures, 1880), working from a chemical basis of investigation, delivered his famous lectures dealing with the subject of the digestive ferments, in which he not only explained the processes of preparation of crude food material for absorption, but also submitted for the adoption of the profession certain artificial ferments that have since taken such a prominent position in pharmacy. Later still, we have that important work by Professor Ewald, wherein, again working from the basis of chemistry, he deals with the function of gastric digestion. It follows in consequence of his investigations our diagnosis is no longer restricted to subjective symptoms; we may draw off the contents of the stomach, submit them to chemical analysis, and thus arrive by exact scientific methods at results of the highest importance in the treatment of disorders of the digestion. There is yet another extension of chemical knowledge equally important. So far back as

1868 Sir W. B. Richardson said—"Ere long we shall be able to manipulate in our laboratories drugs able to produce in the animal economy any effect one may desire without having to obtain them, as one may say, hap-hazard from various plants and other sources." This remarkable prediction is rapidly undergoing fulfilment; "Materia Medica," once stigmatised as a study dealing with "pharmaceutical wares," has become the study of "pharmaco-dynamics." The active principle of all drugs is, by chemical means, isolated; their exact composition, atomic and molecular, ascertained; their physiological action investigated; and their therapeutical results anticipated. I cannot allow the subject of chemistry to pass without reference to the new departure in chemical investigation known as stereo-chemistry. By this striking branch of successful activity the minute co-ordination and interspatial relationship of the atoms within the molecules are being found to play an essential part in chemical composition. Consequently chemists have proceeded to construct for themselves new bodies, or to divine with startling accuracy the real groupings of the carbon compounds in all their great variety and significance. Take, for instance, the separation of guiacol, synthetically prepared from the elements found to constitute the active principle of creasote, salicine, and others. In consequence of these discoveries, notice the increase in recent inventions of drugs. In 1894 pharmaceutical novelties were more numerous than ever; so numerous that their names and formulæ collected under one cover would form a serious volume—in fact, like spies, they come in battalions; they are too numerous. The medical men of to-day would gladly cry, "Hold, enough! Allow us a little breathing time that we may collect some evidence of the value of the many remedies and specifics that have already been brought under the attention of the profession." In fact, "not only," as Sir William Broadbent so well puts it, "are we striving to know the effect of remedies, but how these effects are produced. This is a question for the chemist; all vital action attended by molecular or chemical changes are, from one point of view, chemical action, and come, therefore, under the law of correlation of force and conservation of energy; consequently the physiological and the therapeutical action of drugs should be sought for in the chemistry of the vital processes." In a word, the time is rapidly coming when the dream of some Socialist that all food will be formed by the will of the chemist out of the elementary bodies of Nature, may not be without some premonition of ultimate realisation, for, in medicine at any rate, the chemist is rapidly bringing under synthetic control whole groups of atomic and molecular bodies.

EXPERIMENTAL PHYSIOLOGY.

(*f*) Then again, science, as subsidiary to medicine, has of late years made a progress almost triumphal in the field of experimental physiology: in fact, it is not too much to say that through its aid in many respects our knowledge of disease and our method of treatment have been revolutionised. Take, for example, the nervous system. Ever since Ferrier's epoch-making book in 1876 we have seen arise a new school of thought and action in this department of work. Everybody of my own age will call to mind the easy reference to spinal or cerebral paralysis so familiar on the lips of our predecessors. Every form of graver nervous disturbance, whether due to tumour, abscess, or degenerative change, was, as a rule, covered by either of these generic expressions. Now, one has only to recollect that every function of the body is regulated by nerve force to be aware how wide and complex is the study of nervous diseases, and how misleading it is to refer serious nervous disturbance to some obscure thing covered up by an obscure verbal formula or half a dozen verbal formulæ. Everyone is aware that the physiology of the nervous system is but the vestibule of nerve pathology, and that discoveries in nerve physiology necessarily lead to corresponding changes in our knowledge, or opinion, in connection with nerve pathology. That being so, there has come into existence an entirely new literature, and certainly a new nomenclature. "Until recently," says Byrom Bramwell in the preface of his well-known book, "the affections of the spinal cord were generally looked upon as so obscure and difficult as to baffle the understanding of any but the most accomplished specialist. Thanks, however, to the labours of Turck, Leyden, Charcot, Erb, Gowers, Buzzard, and others too numerous to mention, the difficulties are rapidly disappearing, and in a short time we shall probably be as well acquainted with the diseases of the spinal cord as with any other affection to which the human economy is liable." As to the practical result that has ensued from additions to our knowledge of the functions of the brain, let me point to the work of MacEwen, of Glasgow, who, in that remarkable address delivered in 1888, described operations on the brain—or, rather, in it—that but a few years before, when the localisation of different centres was still unknown, would have been absolutely impracticable. Who, for instance, in 1871 would have ventured to open the cranium and slice into the brain for the removal of tumour. In this context should not be omitted the labours of Horsley, who has ventured, with conspicuous success, on more experimental lines of work than perhaps any of his predecessors; while his appliances and methods are distinctly valuable additions for these more advanced surgical procedures. I might mention, too, an operation performed here in Dunedin very early in the course of the changes covered in this brief sketch. This was the removal of a tumour from a patient, in the course of his private practice, by my old, much valued, and deeply-regretted colleague, the late Dr. Maunsell. Work of this description is the direct application of experimental methods. Not to linger more over this most interesting subject, let me pass to the recent acquisitions to our knowledge of the physiology of the ductless glands, and the corresponding pathological knowledge that discoveries in this branch of physiology have induced. It was in 1874 that Sir Wm. Gull brought prominently before the profession, by a careful and accurate description, a form of disease which he recognised for the first time, and was subsequently named myxœdema. This condition in 1878 was attributed by Ord to a lesion of the thyroid gland. Four years later the Reverdins, in describing operations for goitre involving removal of the thyroid, pointed out how subsequently symptoms arose closely allied to those of myxœdema, and hence this variety of the disease was called by them "operative myxœdema." The results of the Reverdins led to further experiments, until it was discovered by Schiff that the symptoms induced by the removal of the thyroid were, in their turn, prevented by grafting elsewhere, either beneath the skin or into the peritoneal cavity, portions of the thyroid gland itself. Mark then the effect of these discoveries; a fatal disease, which a few years ago would have been absolutely unrecognised, can now be hardly overlooked by even a superficial observer, and by most simple methods of treatment can be kept in absolute abeyance. Further still, the treatment of an allied disease called cretinism has been placed on a satisfactory footing. Now, the cretin is known by his stunted growth, his harsh, yellow thick skin, his disproportionate head, his protruding tongue and dribbling saliva, his puffy swollen face, his wabbling gait, his imperfect speech, his dwarfed and obscured intelligence. What remedy was ever proposed a few years since for the relief of his pitiable condition? Certainly, so far as I know, until the end of the eighties there was no remedy even conjectured. This miserable condition of the body is now traceable to defective secretive action of the same thyroid gland, and may, as has been proved, be successfully coped with by the administration of the thyroid extract. Attention might also be directed to recent discoveries connected with the pituitary body, the pancreas and the supra-renal capsules, and the deductions therefrom. The general results, however, may be summed up in Schafer's words; they point to the notion "that internal secretions are yielded both by the ductless glands, and by what are generally known as the true secreting glands, and that such internal secretions may be of no less importance than the better recognised functions of the external secreting glands." But this subject has before it a vast future, for notwithstanding the brilliant results of experimental science much remains to be elucidated. Yet there already exists physiological knowledge enough to bring about great and highly important changes in the practice of medicine, while the facts already ascertained point to the better understanding of many morbid symptoms that have hitherto eluded or baffled diagnosis.

PROGRESS OF BACTERIOLOGY.

We now approach the final subject selected in illustration of my main contention — that is, the discovery and progress of bacteriology. It is impossible to think about this matter without connecting our train of thought with the imperishable name of Pasteur. This great modern apostle of truth was with us in spirit, but belonged not to us in the letter; he was not a medical man, nor was he trained in medicine. He has so lately died that there is hardly yet time to fully estimate his services to science. However, in 1892—Pasteur then being in his seventieth year—our own Lister, with the gracious modesty and self-repression so characteristic of the man, addressed him thus: "Your researches in fermentation have thrown a powerful beam which lightened the baneful darkness of surgery and has transformed the treatment of wounds from a matter of uncertain, and too often disastrous, empiricism, into a scientific art of sure beneficence. Thanks to you, surgery has undergone a complete revolution which has deprived it of all its terrors, and has extended almost without limit its efficacious power." It is quite outside the scope of this address to bring before you a review of Pasteur's work; this has been recently made with much weight and power by Dr. Percy Frankland. There is one point, however, well worthy of consideration, the correlation that exists in all scientific knowledge; how beautifully it is illustrated in Pasteur's transition from his studies in chemistry to his biological researches. As is well known, it was in chemistry and molecular physics that Pasteur won his early triumphs. Upon his observation on the tartrates and paratartrates, and his appreciation of those conditions under which apparently identical chemical bodies cause the plain of polarised light to rotate in different directions, the theory of the dyssymetrical atomic relationships in the molecule is founded. It was but an extension of these studies that landed him amid the phenomena of fermentation, upon which the whole science of bacteriology is built. What has been the effect of bacteriology on the work of Lister and of Koch in surgery and medicine? In answer to this question

Sir Russell Reynolds said in August last in his presidential address to the British Medical Association, that twenty years ago even the dauntless surgeon Sir William Ferguson would have paused ere performing an operation which any one of his dressers of that time might now publicly perform without fear or dread. It is not too much to say that there are few organs or systems of the human frame that at this day may not be handled surgically in absolute safety and with beneficial results. All who remember the surgery of twenty-five years ago must recognise that our results now depend more on the careful and intelligent application of scientific principles in our methods than upon that manipulative skill on which the great surgeons of the last generation based their success. The confidence engendered by our recently acquired knowledge enables young and comparatively inexperienced surgeons to save lives which, but a few years since, would have been inevitably lost. The isolated country practitioner not infrequently performs and brings to a successful issue operations which a quarter of a century ago would have been considered too hazardous for the most skilled hospital surgeon with all the best appliances at his command. That manipulative dexterity which is so rarely acquired, except by an extensive and ripe experience, it is not in the power of all to command, but the advance that is common to all is the elimination of the most fatal element in surgical procedures of the last generation—the youngest operator can make himself safe against the risk of septic complications, and every desperate case which recovers is a living monument to the work of Pasteur and Lister. Let me pass on briefly to touch upon work still later than that of Pasteur; achieved, however, by the extension of his methods. "The history of scientific progress is largely the history of scientific method," and it was to the improvement of method in connection with bacteriology, with pathology, and hygiene, that Robert Koch addressed himself. For Koch by improved methods of staining, was able to identify many varied forms of micro-organisms, while he established rules or principles by which the germs of disease are, one by one, being identified, isolated, cultivated, classified, and examined. For instance, his researches into the life history of tubercle have profoundly modified our views about the widespread, terrible, and infinite varieties of tuberculous maladies.

ANTI-TOXIN INVESTIGATIONS.

The next step led to a discovery that, externally to the human frame, disease germs may be cultivated in broths and gelatines, substances that thus become impregnated with the characteristic poisonous alkaloid or toxin. If these are sterilised by killing the bacillus, the remaining impregnated broth or gelatine contains principles or toxins which produce the symptoms of the disease identified with the bacillus. These toxins, now viewed as mere drugs, may be administered in definite doses, being increased gradually until tolerance of the poison is set up; a condition of body is induced which renders the organism practically impregnable to the ordinary dose of the poison. With this condition of immunity we get the surprising result that the animal itself, within its own blood, gradually builds up a resistant to the toxin so as ultimately to nullify the power of the poison. This resistant, or anti-toxin, created within the animal frame by the conservative energy of some ill-understood vital process on being separated off from the blood of the immunised animal, becomes and is an appliance in the hands of the therapeutist whereby he is able to inoculate a patient against the specific malady from which the anti-toxin has been isolated. The infant condition of this experimental knowledge would make it almost hardihood to deal with the subject in general terms; yet I transfer to these remarks the closing paragraph of Frankland's address, quoted by him in its turn from a French writer:—"When man first learnt how to protect himself from the wild beasts he made the first step to civilisation; to-day man is learning to defend himself from microbes. A day will come when in Berlin, in London, in Paris, a man will not die of diphtheria, of typhoid, of scarlet fever, of cholera, or of tuberculosis any more than he dies in those cities to-day of the venom of snakes or of the bite of wolves." In illustration of this prediction may be quoted the most recent statistics of diphtheria, where it is shown that in Berlin and other German towns the mortality has fallen from 34 per cent. to 11 per cent.—that is, that where three patients within recent times would have succumbed to the disease two lives are now saved. As since 1880 all this class of investigation has expanded with marvellous celerity, we may expect at no distant date pneumonia, erysipelas, sepsis, besides all "the brood of fevers ever new," will give way before these battalions of antidotes. Will anyone allow himself the luxury of examining what might be the effect on the popular mind of the discovery of a specific anti-toxin of cancer? There is nothing that more effects the minds of women than morbid imaginings in connection with this insidious and relentless malady. Consider how rapidly and widely those preparations of distilled water got up with fanciful accessories of label and bottle, and promulgated with all the energy and tenacity of Mr. W. T. Stead, effected an entrance into public acceptance all over the world. What in Biblical narrative we note to be the popular estimate of leprosy, that estimate to-day is occupied by cancer. It is one of those few topics patients will not admit into conversation, perhaps the disease patients will huddle up and conceal under a mass of veiled reference, or endeavour to hide, at all risks, from those whose affection might be expected to expand into profound sympathy. But good work is doing in this direction, and may be watched in the full hope of practical results, for the germ of this dread malady seems to be within measurable distance of discovery; for, notwithstanding the special difficulty of identification, eminent and trustworthy authorities are of the opinion that the protozoa of cancer have been detected, although it remains for furthur scientific diligence to identify beyond cavil the existence of the germ and the processes of its life history. In all these anti-toxin investigations with their results, there is one profound truth borne with added evidence upon the mind: that old truth about the "*Vis medicatrix naturæ;*" we have of late years heard a great deal of the "*Vis vastatrix naturæ,*" of "Nature, red in tooth and claw," but in these subtle investigations the older aphorism seems the truer. Nothing can surely be more impressive than the fact that in the blood, slowly and gradually impregnated by the virus or toxins of disease, there is, equally slowly and gradually, set up an anti-virus or anti-toxin, and that the withdrawal of this anti-virus from the blood charged with it, puts into our hands a specific against the original disease. How far and into what obscure realms of disease these investigations may yet be pushed remains to be seen, but I do not hesitate to say that among the many discoveries this amazing nineteenth century has witnessed, these applications of scientific methods and scientific progress to the service of suffering humanity will take a front place, and that the discoverers should be recognised as amongst the foremost benefactors of mankind.

THE SCHEME OF PROFESSIONAL STUDY.

In the face of these vast changes, what corresponding advance may there be discerned in the education provided to meet the consequent new conditions. Practically, a survey of the range of medical education throughout the Empire shows that there has been very little change in the education we provide at the earlier stages of a young man's course. The conditions of entrance into professional study vary in a remarkable degree. While the Universities of Oxford and Dublin do not confer a medical degree except the candidate has previously graduated in arts, there are many examining bodies which ask for no further proof of preliminary education in literature and science except that of a common leaving certificate such as a schoolboy may win in England by way of the local examinations, or in Australasia by a somewhat low-graded matriculation. Now, ever since 1873, the year of Forster's Act, there has been in Great Britain and throughout the Empire a fairly satisfactory system of primary education, graded into standards of which the highest is usually passed by children at the age of 13. Three years further study at a respectable high school on the lines of a liberal education should bring a boy to the level of a sound test of a higher quality, I think, than our matriculation examination here provides. Then should ensue two years' study of special scientific subjects preparatory to the strict professional education, which should continue for at least four years further. What, however, is the case with regard to this preparatory study—the belt of ground occupying the space between leaving school and beginning professional education? I venture to think that this most important detail of junior professional work remains in the most chaotic and unsatisfactory condition. The medical man of the immediate future should, above all things, aim at being scientific in his habits of thought and methods of practice. He should have acquired the eye of science, the ear of science, the hand of science, the judgment of science; he should know that he really sees what he is looking at, hears what he is listening for, and touches with discrimination what he handles. He should be capable of judging clearly for his diagnosis, and be in the habit of looking for clearly-recorded phenomena on which to base his ultimate conclusion; his practice and his theory should be mutually helpful. He should be able, not merely in a humble way, to follow the great pathologists of the hour in his application of their work, but also to appreciate their methods and their labours, if not actually ambitious to emulate them. As fast as medicine continues to travel out of the region of empiricism, so will it be needful for empirical modes of thought and practice to be laid aside. We may say after the great German poet, "more light"—that is, "more science, more science": for us, science is light. In my own time the apprenticeship system as a training of young aspirants to the medical profession was still in vogue. It was thought that after registration the best way a young man could commence his work was to enter what might be called a doctor's dispensary. Readers of "Middlemarch," that most faithful picture of medical life in England 50 years ago, will recollect exactly how justly a doctor was then identified with his dispensary. Compounding drugs, extracting teeth, bleeding, dressing of small wounds and sores, with occasional clinical practice among the poor amidst the most adverse circumstances—these were the conditions which were held to seriously incline a young man to his professional career. I believe there are many respectable opinions still expressed in approbation of this older style of medical training. It produced good men; why should it not continue to produce good men? Doubtless, for the knowledge then accessible, the training was good and sound. Most work was empirical, and it was surely of some advantage to be associated with an empiric of great experience and possibly considerable success. So much depended upon observation of more or less transitory significance, that in the absence of scientific or theoretical principles the methods of actual practice were, doubtless, as good as might be got. However, I am inclined to think that if any still advocate the old apprentice plan as suitable to modern requirements, such a man has allowed the tide to run past him: he has failed to note the signs of the times, and does not observe that exact science has advanced, is advancing, and will continue to advance in every department of our work, and that the need for increased opportunities for scientic training become for our junior students more and more impressive. It would be, in my opinion, most beneficial to have one standard of junior work fixed by the Medical Council - a course covering at least two years from matriculation. About the matriculation itself, except that it should be a fairly exact test examination for high and grammar schools so as to give boys a respectable leaving certificate—about this I say nothing, but I am strongly of opinion that for two years subsequently, if not more than two years, the whole time should be given up to purely scientific study. It ought to be noted that, with remarkable prescience, the senate of the University of London have for many years past insisted upon a scientific intermediate between matriculation and the first professional examination. This preliminary scientific examination is of such a kind that it practically enforces two years' work at physics, chemistry, and general biology, and the candidate is not eligible for the final M.B. examination until four years after his success in the preliminary scientific examination. I do not now argue whether it is desirable for us to aim at a standard so rigorously high, because I do not think, in our conditions in Australasia, it is possible to command the supply of men willing to undergo such severely exacting tests; but it seems to me that the first two years of the medical curriculum of the University of Sydney is quite good enough for our wants at the present stage of our population and requirements. In the University of Sydney professional subjects do not come under the student's notice until his third year, during which year he is limited to materia medica and therapeutics. His professional studies do not commence until his fourth year; while chemistry, physics, anatomy, physiology, and biology form the whole of his studies for the first two years. Thus in this admirable course full provision is made for the scientific habits of thought and method for which I am pleading—habits which, if once acquired, hasten amazingly all subsequent progress and make a man more apt to learn for all the rest of his days. It seems to me that what we have a right to demand is that our junior men shall be trained in scientific lines. It is the manner of their training that is paramount: the matter of their training, however important of itself, is really of subsidiary interest. In making this reference to the University of Sydney, I desire to record my respect for the work done in the other medical schools in Melbourne, Adelaide, and in our own. I have visited each centre of medical work quite recently, and have endeavoured to form some estimate of the value of each. I am convinced that according to the standards for which I am contending that the University of Sydney approaches most closely to my ideal. As to the rest of the Empire, the condition of things is still most disorderly. A glance at the last educational number of the *British Medical Journal* will suggest to any unprejudiced person the impression that, in view of the vast forward movement of the past quarter of a century, the time has come for this subject to be taken up, impartially surveyed, and reinstated on a basis suitable to the new conditions, and auxiliary to the undoubted progress which must take place during the immediate future. It was no part of my original design to include in this address the subject of professional education. I have been, in the main, contending that the rapid and wide extension of scientific knowledge has not been yet overtaken by a proper readjustment of the subjects of study for our junior students, to which argument has been added a word or two of suggestion looking towards reform.

CONNECTION BETWEEN HOSPITALS AND SCHOOLS.

But there is a point connected with our colonial system of superior professional education which should not be omitted: I refer to the point of contact between our hospitals and our medical schools. In Great Britain many of the hospitals are of a respectable antiquity, and are older, by many generations, than the schools attached to them; it is not therefore true matter of surprise that these hospitals, hoary with age, find themselves unequally matched with the child that has become almost their rival, and that traditions, vested rights, antiquated regulations should from time to time cause a harsh note of discord to be struck as between hospital and school. In Australasia, where every institution is young—where hospitals, instead of being maintained by endowments and voluntary contributions, are for the most part supported directly out of rates or taxes, while the medical schools have been called into being by universities or acts of Parliament, and are principally maintained out of endowments or rates and taxes—in such a case it ought to be that each is the handmaid of the other: that the home of suffering and the message of relief should be united in the close ties appropriate to the necessities of each, that the science of healing should profit directly, and progress directly, where its work is subjected to the severest tests; that, in fact, methods in healing should be identified with the science of healing, that the teaching body should be identified with the executive body in any hospital where there is a medical school. What, however, do we find to be the case? With one exception, to which I shall advert later, our hospitals are under a control which has nothing to do with any university or any collegiate board. As a matter of fact, the managers of the hospitals know little, and would at times seem to care less, about the medical school; so that the clinical teachers in Australasian hospitals are in no way responsible to the university councils, which, in their turn, are responsible to the public for the character and results of the teaching offered to the students. I take the worst cases I know of—perhaps the worst in the British Empire—in which the interests of the public, of the patients, and of the profession are sacrificed to collateral questions or subordinated to side issues. In Melbourne every fourth year the whole medical staff is exposed to the ordeal of a public election; the Board of Management, much less the University Senate, is allowed no voice, no control; the election is in the hands of the subscribers; hence when the fateful day arrives all the features of a contested election become prominent—election tickets are put out and election devices prevail, cards soliciting your interest and vote for Dr. Drench and Mr. Cutler are found in hotels and bars and railway stations and in cabs. Dr. Drench and Mr. Cutler are for the next four years to be entrusted with thousands of pain-racked men and women, the clinical teaching by the bedside and the ethical training of aspirants to our profession. To secure the position, so responsibile, so admirable, they are driven to have recourse to the usual mischievous dodges, practices, and traps of an election contest. Surely it is a scandal that in any British community, much less in a community which takes pride in its progressive spirit, such a pernicious system should survive for an hour. In Adelaide difficulties arise out of a system not so mischievous, but radically bad; the university has little control in hospital affairs—in fact, only one member of the University Senate has a seat on the Hospital Board. It so happens that in Adelaide matters have worked with reasonable smoothness, because the Government in the past have taken care to appoint to the board men known to have some interest in, and sympathy with, the medical school, but there is no guarantee for permanency in the constitution of things, which seem to be based upon an unreasonable jealousy of the profession or that wider and deeper impatience and distrust of learning—a sentiment noticeable and operative in every democratic community. In New Zealand a similar state of affairs obtains, modified in its features, but powerful enough to have occasionally imperilled the very existence of the medical school. Our survival is simply owing to the enlightened good sense and moderation of the men who have happened to have been elected to the Board of Management during the past few years, and who retain their position on that board in virtue of considerations entirely other than those of the interest of our school. I do not think our profession should escape its share of blame for these results. In a town possessing a medical school it is clear that of our professional men some must be excluded from the university appointments, while others win them; the former being more numerous as well as unsuccessful, co-operate strenuously to oppose the university teachers should they make any claim for priority in the distribution of hospital appointments. The consequence of all these combined sentiments and customs is to dislocate and derange our teaching, to render clinical instruction of relatively weaker value, to attenuate the responsibility and to sacrifice the future of our profession to the jealousies and bickerings of the hour. The University of Sydney, however, now stands clear of animadversions such as these. The difficulties between the university and the board of the Sydney Infirmary were felt to be so great, and the prospects of a satisfactory solution so remote, that it was, in a great measure at any rate, to obviate these troubles that the Prince Alfred Hospital owes its foundation. The relations between this hospital and the University Senate are of a satisfactory character—a fact which, added to what I hold to be the superior arrangements of their course of study, should go far to make the Sydney school the most efficient and most useful of all the Australasian schools of medicine. Surely here is a point upon which we might close up shoulder to shoulder and, in view of the requirements of the age, insist that for the public good it is requisite that our students should be sent out fully armed to cope with the increasing demands upon their knowledge, their skill, and their judgment, and that the bodies responsible for the proper education of our students should have a controlling voice in the appointment of their teachers and in those details of hospital management which directly concern the education of their students. I have digressed a little upon this matter before bringing my Address to a close, because until these barriers are removed our progress will be both painful and slow.

THE DUTY OF MEDICAL MEN.

Passing, however, from considerations that are local and must be temporary, I would desire indulgence for a few words dealing with more general notions connected with our profession. It has been finely said that the most valuable asset of a State or of a nation is the people. A healthy mind in a healthy body is the gist of the old Roman prayer—a sentiment obviously applicable in the widest sense of the condition of a people. The joint prosperity and advancement of a nation depend upon its physical and moral health—on that well-balanced condition of the human framework which interprets and affects all that belongs to thought and action. How far morality depends upon health it is not my province to discuss, but if, as without doubt is the case, the blocking of a minute artery in the brain will ultimately reduce a reasonable and self-restrained man to the condition of a vicious brute, it is obvious that morality and health are united to each other beyond the power of dissolution. If this is so, it must be further admitted that a man's health vitally influences his life, determines the quantity and quality of his work, the nature and variety of his temperament, the influence of his intercourse with his fellows, and his general civic value. The conditions of civilised life often tend to increase the difficulties of maintenance of health. By crowding men into cities disease is more quickly propagated and harder to arrest. New varieties of disease are noticed; perhaps the variety is actually evolved. The changed environment of men tends to slowly bring about a corresponding change in their condition and vital necessities; a change always slow, frequently dangerous, and often ill-understood. Side by side may be noticed a group of moral and social facts, some of them highly disturbing and disintegrating to the previous social and conventional structures; facts which influence directly mental phases, which, in their turn, bring about much dislocation of healthy conditions and states. From this quarter arise all the fads, hobbies, and follies of experiment, which go far just now to interfere for the time being with true progress, and tend to substitute quack remedies for those social troubles which really have their roots deep down in the physical condition of men. It will be largely the duty of the medical man of the future to watch vigilantly those factors, observe their tendencies, and be on his guard in an attitude of expectancy for some manifestation of disorder which will test his sagacity while evoking his powers of admonition and advice. Among other things, it becomes his duty to enforce the claims and necessity for a duly organised department of public health. This is perhaps *the* one point upon which medical men may aspire to a reputation for disinterestedness. If, according to the common notion, we have such a direct selfish interest in disease that an epidemic or period of general sickness means prosperity for the doctor, it is clear that the whole duty of a medical man to himself should be to leave questions of public health alone; to treat with silence all agitation for the supply of pure water, the control of drainage and sewerage, for the improvement of hospital management, for the destruction of filthy and corrupt habitations, for the restraints on adulteration, on the sale of butcher meat and fruit, for stricter administration of preventive laws with regard to quarantine, and generally agitation of any kind in the direction of health reforms. But what, as a matter of fact, is the case? It may be fearlessly asserted that Sir John Simon and Mr. Edwin Chadwick, the first a man eminent in our profession, "invented"

These men undertook their work in pre-Pasteurian days, when all they could do was to improve paving and scavenging, attend to drainage, lighting, and water supply, and prevent overcrowding: but the gospel of cleanliness, at any rate, was established beyond all cavil. In Great Britain, where there are, on the whole, fewer restraints on personal liberty than anywhere else in the world—where in consequence that education that free men give each other is of a higher standard than elsewhere ;—in Great Britain, I say, which stands at the head of the world in the matter of public health and all that pertains to it, matters have been brought to such a stage of perfection that our profession, backed by a highly trained and sympathetic public opinion, has practically more than once rolled the advance of cholera back from the shores of Britain. I was in England in 1892, when the cholera was raging in Hamburg, and nothing struck me more than the zeal and energy of our hygienists in teaching and warning the people of England what to do in the dread emergency. Millions of printed notices and bills were distributed by local health boards and health societies: sensible, pithy, and lucid little articles, useless of course except among an educated community, which, however, were so widely read and applied that, aided by them and a most watchful system of quarantine, Great Britain came through the threat of that scourge unscathed. Thousands of pounds were spent in that campaign, and never were thousands more profitably, and perhaps more skilfully, expended. The impulse to hygienic reform is weaker and more easily expended and exhausted in Australia and New Zealand than it is in Great Britain. There is nothing on this head even now to add to what was so well put before the Congress at its last meeting by Dr. Whittell in his "Presidential Address on Public Health"; but in our New Zealand towns generally, I believe, a movement in the right direction has commenced—public attention has been drawn to the matter by voluntary associations, which have now all the vigour of youth. I hope they will succeed in educating the people out of that ignorant impatience of control, or still more deadly apathy, which, both of them, are characteristic of weaker notions of the duties and obligations of civilised life. Legislation of a more central and less permissive character is desirable—legislation that does not depend for its administration upon the fortuitous and baffling currents of local political feeling. There is need also of increased activity among ourselves, who, if we live *by* the public, live also *for* the public, and have duties which, according to the trust reposed in us, are not measurable by fee or reward. It is always difficult to rise to higher lines of professional duty and activity, but for the younger men it is always desirable that they should cultivate aspirations and ideals, and of this I am certain, that in the immediate future there lies before our profession increased—vastly increased—scientific means and appliances for coping with our noble work, and that to intelligently use these appliances and means will require increase of aptitude, and development of opportunities, for necessary training. For this augmentation of our power augments as well our responsibilities, it will demand on our part a greater mental energy, a more rigid discipline, a more single devotion to our ideal of duty, and a more general appreciation of the work submitted by a few eminent leaders to the opinion and for the adoption of thousands in the practice of our profession. Our increased resources should in the long run tend to produce among ourselves a distinct advance in professional type, while in society at large, by removing or obviating the causes and outbreaks of disease, they should increase the general volume of happiness, and thus augment the social and moral well-being of mankind.

PROFESSOR ALLEN moved that a hearty vote of thanks be tendered to Dr. Batchelor for his most comprehensive and masterly address. Where so many subjects had been dealt with it was difficult to choose material for some brief remarks. But underlying the President's review of the progress of medical science was the truth that the study of every medical man was life itself, an endless study, and notwithstanding all our knowledge an endless mystery. Wonderful as recent progress had been, it was not a revolution but an evolution. Modern discoveries had not pulled down the fair fabric raised by the hero workers of olden days. The glorious body of truth stood firm, but crowned anew with many crowns. Concerning medical education, it was well to remember the action of the General Council of Medical Education and Registration of the United Kingdom. Formerly the course of study as a rule was limited to four years. When it was determined to prolong the curriculum to five years some desired to devote the first year strictly to science work, to chemistry, biology, and physics; while others insisted on the necessity for devoting the final year exclusively to practical work in the hospitals. With characteristic thoroughness the General Council determined to insist on both these reforms, thus declaring that the education of every medical student must rest on a sound scientific basis, but that the development in this direction must be accompanied by more strict attention, more assiduous devotion to the practical study of medicine and surgery. The medical schools of Australasia had already won substantial recognition. Their graduates were now entitled to registration in the medical roll of the United Kingdom, and could then practise without let or hindrance in any part of Her Majesty's dominions. He felt that in some degree he was himself a part of history, as his name was the first entered in the Colonial section of the *British Medical Register*. More recently the Conjoint Board of the Royal Colleges of Physicians and Surgeons of England had resolved to admit graduates of the Australasian medical schools at once to their final examinations, passing by all the preliminary and subordinate tests. Nor was the recognition confined to medical schools. In so ancient and honourable a university as Oxford it had been decreed that two years' attendance in Arts in a university of Australasia should be allowed to rank as two years spent in that old-world centre of learning. Some observers were disposed to cavil at the differences which prevailed in the courses of study and of examination in the medical schools of these Colonies; but probably such objections were based on imperfect consideration. Any attempt to bring all to one level would almost infallibly be a lowering process, a levelling towards the standard of the lowest, instead of an approach to the highest. Concerning the relations of the hospitals to the medical schools one misconception deserved notice. Fears were sometimes expressed that completeness of teaching was scarcely compatible with perfect regard for the interests of the patients themselves. Those present on this occasion would surely agree that these fears were not justified by facts. On the contrary, the more thorough the teaching in any hospital the more complete was the care for the patients. Or to put the matter in another way, if the interests of the patients were not most fully considered, the teaching must be radically bad. It was well for all teachers to remember that their character and their actions made perhaps a deeper impression on their classes than all their direct teaching. What, then, must be the influence on the students of seeing their lecturers engaged in the scramble for hospital positions, so graphically described by the President, with all the accompaniments of puffing, touting, and the other arts of a popular election. It was difficult to advise an unexceptionable method of appointing the medical officers of a great hospital, but surely the problem was not beyond the common sense of these practical Anglo-Saxon communities. With reference to public health, he had the privilege of speaking at a meeting held in connection with the former Congress in Melbourne, laying stress on the relative importance of a permanent commissioner of health as against a Minister who would come and go with each Administration. Experience had shown him that both were necessary —the Minister to control the expert, the expert to advise the Minister, and Parliament through the Minister. In Melbourne a great drainage scheme was being executed, but not a single house was so far connected with it. Yet already there was so great a reduction in the mortality from typhoid fever and from diphtheria that, if the works had been completed, these results would have been hailed as triumphant proofs of success. The outcome of deep drainage was yet to be seen, and would appear in time; but the present improvement was due to the unremitting care of Dr. Gresswell, the Chairman of the Board of Health, and to the observance of those rules of simple cleanliness, the practice of those known principles of sanitary economy on which the President had so learnedly and eloquently dwelt. Such were the subjects brought before the meeting, and he had the greatest pleasure in moving that a hearty vote of thanks be tendered to Dr. Batchelor for this most comprehensive and masterly address, and he invited all present to join in carrying this vote by acclamation.

The motion was carried by acclamation.

The Hon. Dr. Grace: Ladies and gentlemen,—It is my very happy privilege to propose a vote of thanks to His Excellency the Governor for presiding on this occasion. I have always noticed in New Zealand that the person upon whom this pleasant duty devolves is for the time the most popular man in the Colony. Conceive what a joy it must be to me under these circumstances. His Excellency the Governor has shown the keenest practical interest on the objects of this Congress. He himself belongs to a very important scientific body—the navy. When one considers the stage of scientific excellence at which officers in the navy have now arrived, one can readily conceive what has been the advancement in science in the last quarter of a century, and curiously enough that advancement in general science has been marked by increased deadlier weapons for use in war. I remember serving with some of the sailors of Her Majesty's ship Iris, in 1860. The sailors were then armed with Colt's revolvers. It was necessary to put caps on these revolvers, and the sailors' hands were so thick and hard that they had to take off their boots, sit on the ground, place the revolver between their two big toes, and when in that position, endeavour to put each cap upon each nipple of the revolver. This is not a fancy sketch. This I have seen myself, time after time. This is the precise, unexaggerated truth, and I ask you to take me seriously in the matter, for I am quite in earnest. I want to point out that the difference between the armour used in that era and the implements used at this shows very exactly the progress both of civilisation and science during the last quarter of a century. Now, ladies and gentlemen, I want to point out to you that this vast progress in science has been very largely due in our own country and amongst our own people to the great interest which was taken in all scientific matters by the late lamented Prince Consort, and subsequently by all the distinguished men occupying such eminent positions as His Excellency Lord Glasgow now occupies. What I want to draw attention to is this fact: that it is our fortune all over the world to have Her Majesty the Queen everywhere represented by men of the highest intellectual abilities and noblest social qualities. It is on account of the possession of these qualities, and on account of the evidence that His Excellency the Governor displays of their possession, that his popularity in this country is not only so widespread, but so thoroughly merited. Ladies and gentlemen,—I ask you to vote your hearty thanks to His Excellency the Governor for presiding upon this occasion, and I feel sure you will accord that motion your hearty applause.

HIS EXCELLENCY THE GOVERNOR: Mr. President, ladies, and gentlemen,—I beg to thank you very cordially for the kind manner in which you have responded to the vote of thanks so kindly proposed by my friend, Dr. Grace. I can only say it has given me the very greatest pleasure to come here to-night and perform the pleasing duty I had to perform. I may say, in passing, that I am very much obliged to Dr. Grace for trying to connect me with a scientific service; but he forgot to tell you that I retired from the navy twenty-five years ago—before it became scientific. However, I thank him, for he did his best for me. I can only say further, ladies and gentlemen, that I listened with the very greatest interest to the admirable address which has been delivered to-night by your President, and I think that, on the whole, it reconciles me to the possibility of being a patient in years to come. I greatly thank you for the kind manner in which you received the vote of thanks proposed by my friend, Dr. Grace.

The proceedings then terminated.

SECOND DAY: TUESDAY, 4TH FEBRUARY, 1896.

At 10 a.m., in the Chemistry Classroom at the University, MR. O'HARA (Melbourne), President of the Section of Surgery, delivered his Presidential Address.

On the motion of DR. MORRIS (South Australia), a vote of thanks was unanimously accorded to Mr. O'Hara.

At the conclusion of Mr. O'Hara's address DR. HAYWARD (Adelaide) read the Presidential Address, which had been forwarded by Dr. Lendon (Adelaide), President of the Section of Medicine.

On the motion of DR. JACKSON (Melbourne), a vote of thanks was unanimously accorded to Dr. Lendon.

The various sections then met in the classrooms assigned to them, and the remainder of the forenoon was passed in the reading and discussion of papers.

At half-past two the sections again met, and later in the afternoon the members of the Congress were entertained by the Hon. W. H. Reynolds and Mrs. Reynolds at a garden party at their residence.

At 8.30 p.m., in the Chemistry Classroom at the University, PROFESSOR WATSON (Adelaide), President of the Section of Anatomy and Physiology, delivered his Presidential Address.

On the motion of DR. PINNOCK (Victoria), a vote of thanks was unanimously accorded to Professor Watson.

At 9.30 p.m., in the University Library, an entertainment was given by the Dunedin Savage Club, Mr. Woodhouse (president of the club) in the chair.

THIRD DAY: WEDNESDAY, 5TH FEBRUARY, 1896.

At 10 a.m. a general meeting of the Congress was held in the Chemistry Classroom at the University for the purpose of holding a discussion on "Tuberculosis in Man and Animals"; Dr. Batchelor (President of the Congress) in the chair.

PROFESSOR WATSON (Adelaide) was called upon to open the discussion. He said: The aim and scope of this discussion is to wake up the public to the fact that tuberculosis is an infectious, and therefore preventible and (under favourable conditions) a curable disease. The bacteriological—I do not say histological — identity of human, bovine, and other tuberculosis being admitted, and, living as we do in colonies where the pastoral interest is, or ought to be, paramount, we have been wise in calling in to-day the assistance of our best allies, the veterinary surgeons—men who have had ample opportunities of becoming conversant with the diversified manifestations of tuberculosis occurring in domestic animals. I think, also, that we should lay some stress, in the discussion which is to follow, on those manifestations in man and animals which apparently diverge from the old-world types. This does not prevent us trying to solve problems in experimental pathology which for the present baffle the greatest scientists. Much more extended pathological research is needed to permit of a clear and comprehensive classification of the apparently contradictory pathological conditions found in tuberculosis. The diversity of these manifestations is due to more or less recondite conditions—such, for instance, as the portals of entrance of the bacillus, its paths of transit, the quantitative and qualitative nature of its virus, its combination with other pathogenic microbes, the degree of receptivity of the part, and the general and local reaction of the individual. It has been said that tuberculosis is Nature's method of working off the weak—is a disease of degenerate tissues in a degenerate race. It is believed also that vigour of constitution is a defensive agent against its attacks. The immunity which remains after an infectious fever, such as smallpox, has run its course is, as far as we know at present, absent in the case of tuberculosis. Tuberculisation of an individual does not appear to confer immunity. Apart from vigour of constitution, there must in some way be a natural or acquired immunity which enables a less vigorous citizen to escape where, subjected to the same environment, a herculean bullock-driver or a sunny-faced, apparently healthy child, without hereditary history, succumbs. As regards South Australia, I may remark that apart from alcohol, hydatids, and syphilis, the rapid extinction of the native race is due entirely to tuberculosis. Lung cavitation is the exception, glandular tuberculosis followed by general dissemination the rule. In dealing with its pathological aspect I need not waste time by recalling all the conflicting and now more or less obsolete doctrines which obtained amongst the scientific men of different countries prior to the discovery by Koch of the specific bacillus, and its identification as the primary cause of all the multitudinous anatomical phenomena connected with tuberculosis. As regards the histological elements of tubercle, such as giant cells, epithelioid cells, &c., which we were taught to regard as essential elements, many competent observers are disposed to doubt whether the presence of these elements in morbid structures can in every case be regarded as a strict criterion of tuberculosis origin. Koch says any growth of newly-formed tissue is tubercle which contains the bacillus, quite irrespective of situation, histological structure, and distribution. For aught we know to the contrary, there may possibly be such a thing as pathological identity with bacteriological diversity. Cheyne has drawn attention to the fact that often we fail to find the bacillus, although it may be present, as the usual staining methods do not suffice to render all the various stages in its life history apparent to us. So far we know very little of the conditions under which it lives saprophytically. It has not been found growing outside living tissue, the necessary conditions of nutrition, &c., probably not existing elsewhere. Its far distant ancestor may possibly have been a harmless saprophyte widely distributed in nature, which, after the advent of animal life, gradually acquired its parasitic nature by long custom. Were it other than a true parasitic organism, and in consequence merely accidental in living tissues, our struggles against it might well be considered futile. The questions I have to propose are: (1) What are the chief modes of its spread? (2) Is there any large direct relation between its prevalence in man and in the lower, more especially the domestic, animals (bovine, &c.)? (3) Is there any hope of largely diminishing the prevalence of the disease, say by improving the environment? I assume, firstly, that for British subjects quarantine may be put aside, and little is to be hoped from processes of natural selection and intentional human stirpiculture; but, whatever may be the views held regarding heredity and the propriety of legislative interference with the liberty of the subject, it is clear that no consideration of the question can be complete which does not recognise the large comparative incidence of the mortality on the innocent progeny of bigoted and ignorant parents. Secondly, can we do good by improved surroundings, such as deep drainage and drying of subsoil, which have been initiated so successfully in England? Thirdly, what favourable results may we expect by attacking the bacillus or its products directly—*i.e.*, tuberculin?

The President remarked that they must all thank Professor Watson for the lucid and comprehensive manner in which he had introduced the discussion.

THE MEDICAL ASPECT OF TUBERCULOSIS.

Dr. Springthorpe (Melbourne), who had been asked to deal with the medical aspect of the question, said: A disease like tubercular disease—which, according to Hirschberger, kills one-fourth of all children dying under one year old, is responsible, according to Ransome, for one-half of all deaths during marriageable ages, is common, according to McLachlan and others, among the aged, and causes in all some 16 per cent. of the total mortality in civilised lands—merits special attention at a Medical Congress. Nor have we in Australasia any relative immunity from this universal scourge. Dr. McLaurin's statistics show that it is the greatest single cause of death throughout Australasia, and that it is already as common in our large cities as in their European compeers. Our peculiarities, as Drs. Colquhoun, Corswell, and others have shown, are simply its comparative rarity in the young and frequency in the aged, and its later and slower affection of the middle-aged. It represents a great advance to be able to maintain that the disease is not possible in the absence of the tubercle bacillus. Gradually we are becoming acquainted with the life history of this extraordinary germ. We have long known that it resists freezing, boiling, and putrefying, and have lately recognised that it is not an essential parasite in warm-blooded animals, but, under favourable circumstances, may pass a saprophytic existence in polluted environment. As to its frequency in man, the appalling death record may be taken as an incomplete illustration. Equally suggestive is its prevalence amongst the bovines. German and English statistics show a tubercular infection of from 15 to 20 per cent. of the cattle slaughtered, and such Australian records as are valuable prove that our stock are affected in at least equal proportion. And as regards the extent of intermediate contamination of dwellings, buildings, conveyances, subsoil, &c., we have sufficient cause in the myriads of bacilli coughed up daily with tubercular sputum, estimated at the John Hopkin University at hundreds and thousands of millions per patient—some no doubt dead, as Pfeiffer has shown, but many still living and virulent. The actual result is seen in the prevalence of the disease wherever people congregate together and take no care of the infected sputum. Unfortunately in most cases, at least of advanced phthisis, the infection is not simple, but mixed. Antecedent to tubercular infection frequently comes invasion by the influenza bacillus—the pneumococcus,—the systematic weakness produced by zymotic and other diseases, and side by side with the tubercle bacillus itself are found a large variety of pyococci, who now find a suitable nidus for their growth. It is to these indeed that, following good authorities, as well as according to my own experience and opinion, I venture to think are to be attributed most of the septic phenomena which cast such a cloud over advancing phthisis—*e.g.*, the hectic, the emaciation, the sweats, the profuse sputum, the "streptococcus curve," &c. And the recognition of this mixed infection is not only valuable pathologically—it is essential to a satisfactory therapeusis. Next to its recognition the important point regarding the bacillary factor in tubercular disease is the understanding of the means of entrance and of exit. It is beyond question that environment may be polluted by tubercular discharges, and that one serious source of tubercular invasion lies in such polluted environment. Air and earth thus polluted are certainly frequent and extensive agents in the spread of tubercular disease. Stop this avenue of invasion, and how much more subsequent disease might not be prevented. We shall see shortly how lamentably this is neglected. Equally, if not more, important is the great question of tubercular meat and milk. We have already seen the prevalence of the disease in slaughtered animals. As regards dairy stock, statistics prove that it is far more common amongst aged milkers than in any other classes of stock, with a greater tendency also to generalisation, and thus to transmission through meat and milk. Systematic and skilled inspection of the food and milk supply thus stands out as among the most important of the hygienic functions of a Government. It is to the credit of English medicine that it has persistently advocated the second factor in tubercular disease—the constitutional weakness, itself a disease, upon which depends not only successful invasion, but rate and extent of spread. For the healthy human being possesses a resisting power which renders him practically immune against the bacillus so long as he remains healthy; and though the disease cannot start without the bacillus, it cannot spread without the susceptibility. In what this vulnerability really consists it is impossible to say. It is a bacterio-chemical question affecting the strength of cells and serum in the struggle for existence with the invading microbe. But for the full understanding of the tubercular question the English constitutional factor is as essential as the Continental germ factor. We require the union of the two. But whatever its inherent nature, we find clinically that it varies indefinitely in degree, and that the practical difficulty is to discover in what part of the scale the individual case is to be placed, a difficulty which at present is often insuperable, for there is absolutely no necessary relation between progress and extent. The fact is that the constitutional factor not only varies in different individuals, from nothing to infinity, but that it varies in the same individual according to the state of the constitutional health. Herein comes the value of the inflammatory origin of phthisis, once so much insisted upon; and hereon also hinges the possibility of reinfection at any subsequent time. It is perhaps possible also to subdivide this vulnerability into a local vulnerability of mucous membranes, produced by catarrh, germs, &c., and permitting invasion, and a general vulnerability of tissue which allows of extension after invasion has been accomplished, and of course it is this vulnerability and not the bacillus that is the usually inherited factor. Such being the tubercular situation generally, we can now face the question of its recognition in the individual case. The diagnosis of tubercular disease is thus primarily bacillary, and not histological. Yet how few physicians—I speak of English and Australian physicians, and am careful to exempt our Continental brethren—ever search for the bacillus, or even make themselves competent to do so. Outside metropolitan hospitals it is the rare exception to find any such attempt made; and yet certainly a diagnosis, with all that depends thereon, is often only thus obtainable. The bacillary test, however, is defective. There may be no sputum, examination may give simply negative results, and the test itself gives no information as to the presence or extent of the constitutional factor. Hence it requires to be supplemented by clinical examination. Unfortunately neither constitutional weakness nor slight tubercular infection is necessarily recognisable even by the most skilled clinician. Examination is often suggestive rather than conclusive, and this in the very cases where certainty is most desirable. Who, for example, has not met cases in which he found himself unable to be sure as to the tubercular infection of fibroid phthisis, apical consolidation, apical pleural adhesion, pleural effusion, pleuro-pneumonia, chronic bronchitis, bronchitic asthma, or disease of bones, skin, &c.? As an invaluable aid in such diagnosis, I venture strongly to recommend tuberculin. With Whittaker ("Sajou's Annual of the Medical Sciences," 1892) I hold it established that a local reaction following injections of tuberculin is proof of the existence of tubercle at that point, and that a characteristic febrile reaction after injections of ·005 or less may be taken as practical proof that tubercle is present somewhere in the system. In dealing with this question, we must remember the great frequency of unsuspected tubercle. After more than four years' continuous use of tuberculin, I may perhaps claim to speak with some weight upon this point, and I venture to tell this Congress that I have always found tuberculin reliable diagnostically when used with discretion. I am aware that some experimenters have expressed different opinions, but in far the majority of such apparent failures there has, in my opinion, been something wrong with the expectation, or the dosage, or the administration, or the sample. Its use requires practised skill, and its interpretation needs discretion and experience. I have already quoted instances of this diagnostic value of tuberculin in papers before the Victorian branch of the British Medical Association (*vide Australian Medical Journal*, March 15, April 15, and November 20, 1894). Thus I have been able, by the use of tuberculin, to diagnose cases of early phthisis as tubercular before there was any sputum, and whilst physical examination was inconclusive—to eliminate cases of anæmia, to distinguish between influenzal and tubercular consolidation of the apex, between apical pleurisy and early tubercle, between tubercular and non-tubercular pleural effusion, between fibroid phthisis complicated with tubercle and simple irrhosis of the lung, between lupus and tertiary syphilis, between tubercular adenitis and lymphadenomata, between strumous and rheumatoid affections of bone, between tubercular ulceration of the larynx and malignant disease, and between tuberculosis and actinomycosis before examination of the tissues affected. In many instances the results were confirmed by the independent examination of other medical men, and commenting on some of them the editorial of the *Australian Medical Journal* for April 1894 stated that they "certainly show that in tuberculin we have a valuable adjunct to the means at our disposal for diagnosing obscure cases of tuberculosis." And yet I regret to find myself the only medical man in Australasia, so far as I can gather, who makes any use of this, I believe, invaluable aid. If after this experience of its value any of my professional brethren wish to add to their diagnostic means I shall be happy to give all the information in my power as to dosage, administration, &c. Meantime, I content myself with sending round the illustrative chart which accompanied my first paper. As the practical end of all the foregoing comes the great question of the treatment of tubercular disease. It will be at once apparent that I place preventive treatment as incomparably before everything else. This requires, of course, to be dealt with both from the bacillary and the constitutional points of view. The former includes the destruction of all approachable bacilli before their contamination of environment, the disinfection of infected environment, and the prevention of tubercular infection through air, food, and milk. Some, at least, of these requirements demand State interference if they are to be satisfactorily performed; but it lies, in my opinion, at the door of our profession to do infinitely more than is at present attempted. It is almost incredible—yet some years' continued inquiry have conclusively proved it to me—that scarcely a percentage of medical men give any instructions worthy the name for the destruction or disinfection of the sputum, and still less, make any inquiry into the condition of the dairy from which the milk of their sick children is obtained, or direct that the unknown milk should be scalded before use. Who, again, pay attention to the killing of the bacilli that must have collected in rooms and dwellings frequented by expectorating consumptives? And yet, in the absence of these essential precautions, we claim to be treating the case! And, worse still, we permit of others—relatives, friends, and strangers—running known risks of infection without word of warning or advice, with the frequent and unnecessary result of extension of infection to those who were previously free therefrom. Can we wonder that tubercular disease is so rife? If, therefore, we are to sensibly lessen its ravages, the first essential, in my opinion, is the more general recognition that the disease is to some extent infectious, and the spread of information as to the precautions which must be adopted if infection is to be prevented. Advice should be given to patients and their friends by printed slips as to the forbidding of infected milk, the danger of eating meat in a partially cooked state, or drinking ordinary milk unboiled, the necessity of receiving the sputum in special receptacles which are kept moist until scalded or burnt, the disinfection of infected rooms, public spitoons, conveyances, and the like. How this may be accomplished may be gathered from the printed slip, which I send round, which I drew up for the Australian Health Society, a copy of which I have given to each of my consumptive patients, or one of their friends for some eighteen months past. This individual information and effort must, of course, be supplemented by veterinary inspection of dairies and of dairy cattle and of meat supply, improved sanitation as regards the ventilation and dryness of dwelling-houses, and disinfection wherever necessary. And I am one of those who believe that the placing of tuberculosis amongst the infectious diseases and its compulsory notification will be necessary before some at least of these requirements are properly fulfilled. Similarly from the constitutional point of view prevention is the first thing to be aimed at. The best safeguard is personal health; but in-breeding, unhealthy ancestry, and the like, prevent, in many instances, such a birthright, and health is a something that has to be acquired. And where prevention is impossible, the parents should be informed that the constitutionally weak require special care. Thus the milk they drink must be above suspicion, their homes dry, their bedroom air pure, their ailments specially treated, and occupation and climate selected for them. If this were systematically advised and generally practicable, how many more would be resistent against infection! Then, the possibility of becoming vulnerable, either as Solis Cohen puts it, by want of what is necessary, by excess of expenditure of force over power of reaccumulation, or by hindrance of conversion of potential energy into kinetic, must always be borne in mind and translated into the understanding of the individual case. It should be dinned into the ears of all that the price of safety is the maintenance of the individual health. It is in this category that I would venture to place the still despised tuberculin. We are all aware how, with reference to the value of tuberculin as a remedial agent, our profession has jumped from the one extreme of miraculous salvation to the other extreme of unmeasured condemnation. But there have been some at least who, with Burney Yeo, felt that the latter was as hasty and unwise as the former was hasty and premature. And, whilst recognising that given in a certain way in certain cases it was dangerous and even injurious, it was still possible that given in another way and in other cases its potency might be utilised to advantage. It was for these reasons and in this anticipation that, with Whittaker, Coghill, and others, I continued to make therapeutic use of tuberculin, and it is owing to what I have myself seen that I still continue such use. It was early evident that it contained toxin rather than anti-toxin (though both seem present to some extent), that good would follow rather along the lines of a progressive immunity than from a bactericide or anti-bacillary saturation. Small, gradually-increasing doses, avoiding anything like serious reactions, thus superseded large rapidly-increasing doses given with the intent of repeated reactions. Will those who decry tuberculin say they have given the remedy this trial? What has been the result of four and a-half years' testing in this manner in my hands? I have seen a case of tubercular disease of the bones (*Australian Medical Journal*, April, 1894, p. 181) given up by the profession in Tasmania, practically cured, and remaining well to this day. I have seen two cases of tubercular ulceration of the larynx heal completely, and their healing remain so far permanent (Dr. Cox, specialist to the Alfred Hospital, having laryngeal charge of the cases). I have seen a case of tubercular ulcer of the pharynx, practically abandoned by several medical men of repute, rapidly and completely healed under tuberculin. I leave Dr. Kenny to further refer to the case. I have seen a case of lupus improve, according to the patient's father, more than under the best London treatment, relapsing, however, afterwards, though still much better than before injection; very complete local measures being continued, and in my opinion a further course of tuberculin indicated, but not carried out. I have seen a case of strumous eye disease improve out of all recognition. And turning to pulmonary cases, my general report to this Congress may be summarised as follows: All my cases of pulmonary phthisis in an early stage (with one exception) remain well, and some half-dozen are, in my opinion, cured, and free from any sign or symptom of the disease. The one exception has twice got well, remained well for months, and only broken down (so I am informed) owing to very exceptional exposure and adverse surroundings. Coming to more advanced cases—softening affecting a large area, cases of cavity, cases with pronounced hectic, with complications in larynx, intestine, and elsewhere—my experience is not encouraging save in one case. This failure is not surprising. We have here to deal with mixed infection and with the absorption of the soluble products of different pyococci. Against these tuberculin has no power, and large doses are probably generally injurious. But symptomatically, and not curatively, I believe very small doses are frequently of great though transient value. In these views of the therapeutic value of tuberculin I do not stand alone. I have received several letters from Dr. Whittaker, one of the best American authorities, in which he takes exactly the same stand, and in "Sajou's Annual" for 1892 and 1893 he publicly maintains that it remains true, as Koch first declared, that tuberculin is the best remedy we have for pure tuberculosis, and that it radically addresses the products of tuberculosis, but not those of sepsis. Burney Yeo, again, in his "Clinical Therapeutics," agrees that tuberculin has been hastily and unwisely denounced. More recently Coghill, of Ventnor, has reported a number of cases successfully treated by injection, and recorded that Dr. Armand Ruffer has just returned from Berlin favourably impressed with recent results; whilst Adams, of Montreal, has reported a *post mortem* of one of Koch's own cases, in which tuberculin seems to have permanently arrested an extensive and advancing tubercular infection. I have the more confidence, therefore, in recommending its further study to patients and careful physicians. My exceptional case is so suggestive that I quote it at some length. He is No. 13 in my second progress report (*Australian Medical Journal*, February, 1892). He had acute mischief, implicating the upper half of the right lung, and was so bad that, even in October, 1891, I declined to inject him. At his earnest wish he was injected and progressively improved. He has been injected ever since, in all some hundreds of times, for the last two years irregularly, ·02 once a week or so. He has never missed a day from work since his discharge from hospital; still brings up sputum containing a few bacilli, and has a gradually descending cavity at the apex, with the lung below at times clear, at times invaded by sounds. His general health is excellent; his left lung absolutely clear; his weight maintained at a good standard, though he lives in poor surroundings; has had no holiday;

and undergone a number of influenza attacks. Of course he has taken such general tonics as I have considered advisable. I am of opinion that tuberculin has arrested his disease, and I think it probable he has acquired an immunity against tubercular infection. With M. de Bavay I propose to try his blood serum in the treatment of other tubercular cases, and need hardly say that I look forward to the result with very great interest. It thus seems possible that tuberculin may prove of great service even in acute cases, under circumstances which require to be tested before they can be determined, and from my experience I can add that in experienced hands testing is not necessarily attended with any risk. The generality of such cases, however, need something different from tuberculin—a mixed anti-toxin peculiar to the individual case,—and it will be another of M. de Bavay's and my attempts during the year to manufacture such a mixed anti-toxin (upon lines that we have agreed upon but do not feel at present justified in proclaiming), and to use it in suitable cases. Next to attempts after progressive immunity and suitable anti-toxins comes the influence of climate and diet. As regards climate, I have time but to refer with approval to Theodore Williams's and Weber's work, and to express my opinion that in the majority of cases at present climatic treatment must be placed before any other therapeutic procedure. It would be a great gain if some competent authority would prepare a handbook for the profession upon the important question of Australasian climatology, and if this Congress would forward to the Home medical Press a resolution pointing out the cruelty of dumping down on these shores advanced and often friendless cases of phthisis, and of the unsuitability of the coastal regions for phthisis in any stage whatever. Upon the question of diet, the only point upon which I would now lay stress is the advisability of every physician providing himself with a printed slip of diet scales, or articles suitable to cases of consumption, and marking thereon the requirements, general and particular, advisable in the given case. As regards drugs, I think a lecturer on therapeutics has little to add. We all know the place filled by cod liver oil, hypophosphites, arsenic, quinine, strychnine, iron, the mineral acids, &c. Few probably will deny that we have no specific, that creasote and its allies are of value against sepsis rather than the bacillus, and that the different symptoms which may arise during the course of the disease require from day to day, as well as from year to year, all the different combinations of remedies that the greatest experience and the wisest skill can suggest. Symptomatic treatment is not what we should aim at, but in a disease such as tuberculosis is at present, it is often our only resort, and from the palliative point of view, it is gratifying to know that we can so frequently relieve, even though cure is out of the question. But it would be impossible, even if it were appropriate, in such a paper as this to attempt any particularisation in such matters. Let me end where I began. It is by our preventive measures rather than by our remedial that we shall check this fell disease, which is so widespread that, according to Lord Playfair, it is the only one above the horizon from which we may anticipate the extinction of our race.

The President remarked that they had all expected an original and brilliant address from Dr. Springthorpe, and that they had not been disappointed. He would suggest to Dr. Springthorpe that the question of the resolution should be left to the end of the discussion—[Dr. Springthorpe indicated his assent]—and he would call on Dr. Syme to open the discussion in its surgical aspect.

SURGICAL ASPECT OF TUBERCULOSIS.

Mr. G. A. Syme said: The surgical aspects of tuberculosis have been so thoroughly and ably presented to the profession in the recent writings of Watson Cheyne, N. Senn, and F. Treves that it is hardly to be expected that much new light can be thrown on the subject by those who take part in this debate. It may be possible, however, to so marshall some of the facts already known as to concentrate attention on points concerning which opinion is not quite unanimous, and perhaps even to lead to some agreement as to future action. When I began the study of the profession, tuberculosis—or scrofula, as it was then generally called—could hardly be said to have a surgical aspect at all. That it has one now is due to the long-continued and earnest labours of the pathologist and bacteriologist, to which reference has been made by Professor Watson. As soon as the surgeon grasped the true significance of their results he completed our knowledge of the subject by demonstrating that tuberculosis, as it presents itself to him in practice as an actual disease, is eminently curable, and especially by operative measures. The surgeon recognised that, if tuberculosis is essentially an infective process, not only generally but locally, starting from a recognisable focus, his object must necessarily be to thoroughly eradicate that infective lesion as soon as possible, and with the least disturbance of the function of the part affected, and this procedure the genius of Pasteur and Lister rendered possible. It is the recognition of this principle of action that has lead to the brilliant results now obtained in the treatment of so-called tubercular abscess by opening, scraping, and flushing until the tubercular material in its walls has been completely removed; to the successful treatment of bone and joint tuberculosis by thorough erasion and gouging out of osseous tubercular foci; of tubercular epididymis by scraping and removal; and of tubercular disease of lymphatic gland, kidney, appendix caeci, breast, and other organs by their early removal from the body. In a recent address on this subject Mr. F, Treves deprecates early operative interference in many of these cases. especially in tuberculosis of gland and joint, and maintains that fresh air and sunlight, and especially absolute rest, ensured by proper splinting, will work wonders. Mr. Howard Marsh takes the same view in his recent work on diseases of joints, and I am far from denying the efficacy of such measures; but, presumptuous as it may seem for a humble colonial surgeon to differ from such eminent authorities, it has appeared to me, as the result of my own observation, that the adoption of conservative treatment involves an immense waste of time, and, while undoubtedly keeping the tubercular process in check, a focus is left, ready to light up on the slightest provocation. Besides the actual removal of tubercular deposits, other measures of undoubted value may be employed by the surgeon with the object of assisting the natural process of cure and bringing about fibrosis. The chief of these are the injection of preparations of iodoform, chloride of zinc, sulphur, and other agents. When not curative these methods are often useful as preparatory to complete removal, and may, I think, help to mitigate what is undoubtedly the great objection urged against operative interference—viz., the occurrence of general infection. Statistics show that this does occur fairly frequently after operation, but I am not satisfied that it has been shown to occur more frequently after operations conducted with modern precautions than in cases treated by conservative methods. Another objection raised against radical measures is that the focus removed by the surgeon is rarely the primary, which is so often a bronchial gland and inaccessible. On this line of reasoning the surgeon must simply fold his hands and leave all his cases to the physician to be treated with tuberculin and constitutional measures. Brilliant as have been the results of treatment of surgical tuberculosis, there are lamentable exceptions when we come to certain regions which are yet not altogether inaccessible. It may fairly be said that up to the present surgery has not been able to afford much, if any, relief in cases of tuberculosis of the alimentary and respiratory tracts, and of the cerebral meninges. This is, no doubt, owing to some extent to their anatomical characteristics, but chiefly to the tendency to multiplicity and wide diffusion of tubercular lesions affecting these regions. Tuberculosis of the urinary bladder also is far from amenable to surgical treatment—perhaps because adopted too late. Do we operate sufficiently early in these cases? Operative interference in pulmonary tubercle has been restricted almost entirely to the drainage and cleansing of large cavities in the late stages of the disease—to palliating the effects of the pyogenic cocci, and not to removing the disease, and, as a rule, with unsatisfactory results. Why should not some attempt be made to deal with this formidable and generally progressive disease in its early stages? As soon as a patch of tubercular deposit can be definitely diagnosed by the physician by the aid of tuberculin and other measures, why should it not be removed surgically? We remove hydatid cysts from the lung with impunity, and while the conditions are admittedly different some attempt in this direction seems justifiable. Some time ago my esteemed and distinguished colleague, Mr. T. N. Fitzgerald, was in the habit of passing insulated needles into tubercular lungs and attempting to electrolyze the consolidated patches, though I believe without any success. But why not go a step further—cut down upon and expose the patch and remove it with a galvano-cautery? In the case of meningeal tubercle, again, has our treatment been sufficiently radical? In peritoneal tubercle it seems to be the incision that is beneficial in cases relieved by laparotomy, and not the drainage. Have we incised the meninges sufficiently and at a sufficiently early stage? Whatever view we hold on these questions, I wish again to insist on the advisability of early operation in the tubercular arthritis of childhood. The surgeon then works hand in hand with the pathologist, showing, as Mr. Macnamara has recently observed, that the majority of these cases begin as a local deposit in the bone, and if this be removed the joint can be saved. The osseous origin of these cases has long been recognised in Melbourne, where the teaching of Mr. Fitzgerald has had much influence, and was brought forcibly under notice in a paper by Mr. Fred. Bird about two years ago. In the more purely synovial cases also early operation reveals that the deposit is generally localised at first, and can be satisfactorily removed without detriment to the subsequent mobility of the joint, at all events in the knee, ankle, and elbow. In the hip, anatomical arrangements interfere to some extent, but by the use of a combined anterior and posterior incision, the difficulties can generally be surmounted. To sum up, I maintain that tuberculosis from a surgical point of view is eminently curable; that the surgeon must endeavour to remove the infecting focus of disease with as little disturbance of position as possible, compatible with thorough eradication, and that while rest and constitutional measures will effect this, the best, most speedy, and lasting results are generally obtained by early operation. Constitutional treatment by fresh air and sunlight, and good food is undoubtedly just as important for combatting the inherent predisposition to tissue change under the irritation of the tubercle bacillus, as are these operative procedures directed towards the removal of the bacilli and their effects in cases of surgical tuberculosis.

GENERAL DISCUSSION.

Mr. A. Park, M.R.C.V.S. (Wellington), remarked that the important subject of tuberculosis had received a large amount of consideration during the last few years. During investigations actinomycosis had been found associated in animals with tuberculosis, or, rather, mistaken for tuberculosis; and another disease which was associated with tuberculosis was hydatids, or tuberculosis had followed on hydatids. He exhibited a large number of specimens, and photographs of lesions in animals, and expressed himself as being perfectly satisfied that with tuberculin he could eradicate tuberculosis from the dairies.

Dr. O'Hara (Melbourne) said it seemed to him that if such men as Lord Salisbury and Mr. Chamberlain were surgeons of to-day they would look on the intrusion of the tubercle infection as they did on the intrusion of Germans at the present moment in England—that was to say, they would, by careful selection and by strengthening their arms, protect their shores, and it seemed to him that until the profession looked at the matter from a hereditary point of view it was not of the slightest use their considering it from the point of view of environment. So long as strumous children were born they must expect tubercular disease to flourish. About two years ago he was invited to give a lecture at Melbourne University, and he chose heredity and environment as his subject, and he remembered that he laid stress on the same point then. He knew the case of a large flockowner who received 500 guineas for a ram, and out of the money gave his daughter a marriage portion and united her to a broken-down strumous subject. That showed the necessity of education in these matters, for many sheep-farmers paid more attention to the breed of their pet lambs than to the breed of their own children. With regard to the surgical aspects of tuberculosis he was sorry he could not altogether agree with his friend Mr. George Syme. There was one name above all others which, he thought, in the surgical treatment of tuberculosis, should be put on the scroll of fame, and that was the name of Thomas, the inventor of the hip joint splint. There was hardly a surgeon in the room who had not been able to see the results of hip joint disease treated by rest in the early stage. Mr. Marsh had recently brought out a book on the treatment of joint diseases in which particular stress was laid on the tubercular treatment of joints by absolute rest. Mr. Marsh laid great stress on the objection raised by mothers to putting their children to bed for a year or eighteen months, but what a satisfaction it was to the surgeon to see a child, so treated, with the beginning of hip joint disease, lose its limp, and in two years' time run about with perfect use of the joint which had been saved from the surgeon's knife. He thought that the advantage accruing from the use of Thomas's hip joint splint could not be overstated. With regard to the introduction of tuberculin in the treatment of disease, he had not the slightest doubt that they must put it in the first place as far as the purposes of diagnosis were concerned. He looked on tuberculin as marking a distinct advance in that branch of professional work. With regard to operative interference with cases of pulmonary tubercular conditions, he hardly thought that could be put side by side with surgical interference with hydatid cases, for Nature had admirably arranged for the surgeon in hydatid cases, whereas when tubercular abscesses were formed there was the risk of complications setting up empyema. Such were, however, the possibilities about surgery at present that he was not surprised at anything he heard nowadays. He could not leave the subject without expressing his admiration for the addresses which had been given by Professor Watson, Dr. Springthorpe, Mr. Syme, and Mr. Park When the result of this discussion came before the world with such able demonstrations as they had had, he thought a feeling of gratification would be expressed that they had not let the matter rest, and he was only sorry that the demonstrations by Mr. Park had not been made with limelight.

Dr. Murray-Aynsley said there was one point he would like to notice. Nearly all the addresses they heard on tuberculosis were pessimistic in tone; they were told how difficult it was to escape infection and how powerless they were to deal with it, and even that the whole race was to be extinguished by it. Speaking as a pathologist, he would say that nearly everyone who had made *post mortems* must have noticed in many bodies old tuberculous spots that had been healed. Tubercle must be widespread, and they knew that in many cases, without treatment, it had been healed. He had not been quite satisfied with the results that had followed his use of tuberculin, but must admit, after hearing Dr. Springthorpe's paper, that he had not used it rightly. One great advantage of these congresses was that they were enabled at them to see their mistakes. Most of the cases in which he had used tuberculin had improved, and two cases—one a very serious one—had been cured. He joined with those who strongly condemned the cruel practice of dumping down in the colonies homeless phthisical patients. Case after case of this kind had come before him, and he found that the patients were sent out by medical men. When surgeon of a ship he found the same to be the case, and he knew of one man who, having a large cavity in both lungs, had been sent on a sea voyage for the benefit of his health.

Dr. Garland, as a practitioner of twenty years' standing in New Zealand, said he had been much impressed with the increase of tubercular diseases. At first such diseases were comparatively rare; now they were exceedingly common, and he thought the methods advocated by Dr. Springthorpe must commend themselves to practitioners. Four years ago he had read a paper on the treatment of tuberculosis by creasote. When he read the paper one of the patients had died, and of the six then alive only one patient had died, and he was in an extremely advanced stage when he came under treatment. Of the others, three were in a very satisfactory condition. The cases (the notes of one of which were read), he thought, showed the great advantage of the treatment of tubercular disease by creasote, added to residence in a high altitude. He had found that residence in Central Otago, at Queenstown, and other places where the elevation was from 1000 feet to 2000 feet, proved very beneficial to patients with no treatment at all, but with such residence and with creasote treatment he looked upon tuberculosis in its early stages as curable. He had seen early cases of hip-joint disease with perfect rest go on so as to necessitate excision, although perfect rest was no doubt of very great advantage.

Mr. S. S. Cameron, M.R.C.V.S. (Dunedin) expressed satisfaction that veterinary surgeons and medical men had met on common ground to discuss diseases common to their respective patients. He desired on behalf of his colleagues to acknowledge the compliment that had been extended to them. At the same time he remarked that the compliment, he believed, had been deserved, because of recent years veterinary surgeons had done a great deal of good work, and many reforms and improvements that had been effected had been augmented by members of the veterinary profession, particularly in Germany and Russia. Dealing with the subject before them, he said he thought that sufficient stress had not been laid on the universality of the disease tuberculosis. It was found in all animals, and had recently been artificially produced in fish. The only domestic animals that had comparative immunity from it were the goat and the donkey, and even the donkey was subject to the disease, but was mainly recoverable. Veterinary surgeons had any number of opportunities of getting evidence to establish the communicability of the disease from one to another, as from the cow to the calf, and the calf to the pig; and it appeared to be a reasonable and fair assumption that the same communicability might take place between the lower animals and man. The disease is very prevalent in pigs, and the pig more nearly approached man in regard to anatomical construction than any other animal did—in fact, he did not know of any practical difference between a young milk-imbibing pig and a young milk-imbibing child. It was a fallacy to suppose that the disease did not exist or could not prevail to the same extent as elsewhere in a country where animals lead a free life. The disease did exist under such conditions as in Australia, where they roamed in paddocks instead of being penned up. Tuberculosis was a disease of early life or of matured age, and it affected old animals more than young ones. This should be remembered in Australasia, where bullocks were commonly not killed for meat till six, eight, or nine years of age, whereas in England they were generally killed at from two to four, and were considered very bad meat if left longer than four years. An infected animal in the colonies thus had a longer time in which to run about and carry the infection to water-holes and camping grounds. He believed one of the main causes of the spread of tuberculosis had been the want of opportunity afforded to medical men to trace the source of the disease. In cases of diarrhœa and intestinal tuberculosis it might be often suspected that the cause was in the milk supply. Up to a late period there had been no means here of tracing infection to that source, but during the past three months he had been making an inspection of the dairy cattle supplying milk to Dunedin, and had kept a register of the condition of all the dairies and all the dairy cattle, with notes on the health of the cattle and so on, and by the courtesy of the City Council that register would be open to the inspection of medical men in Dunedin. He sincerely hoped the medical men would take advantage of this in any case in which there was the slightest suspicion that milk was the cause of the trouble. The importance of this would appear when it was realised that 45 per cent. of cases of tuberculosis of the intestines were in children under five years of age. In concluding, Mr. Cameron spoke of the difficulty veterinary surgeons had in diagnosing the disease. An owner was not anxious to tell them all he knew about a suspected cow, and it would help the veterinary surgeons if they could use the tuberculin as a test. That this was a good test he had proved, and in one case the test applied under the directions of Dr. Springthorpe had resulted in saving from destruction a valuable bull that was under suspicion, but was now all right and doing stud service. The speaker took the opportunity of correcting the statement that tuberculosis could not be detected in cooked meat. Such a statement was absurd.

Dr. Chapple dealt with the preventive aspect of the question, and the need for instructing the public as to the means for keeping down the spread of tubercular disease. The spread of this disease among cattle really threatened the community with great danger. Four years ago, when spending a holiday on the West Coast of the North Island, he was asked to look at some young stock that had been bought for the purpose of being killed and examined. They were what were called "wasters," and a good deal of doubt existed as to the cause of the disease. So virulent was this disease that whenever farmers noticed that cattle on good pasture began to waste they tried to dispose of them, and they were sent to the stockyards for sale. An examination proved that the intestinal canal of these animals was studded with tubercular ulcerations. That opinion was confirmed by Dr. Roberts, and when it became known, within a fortnight fifty head of cattle were slaughtered. It was simply want of knowledge that caused the settlers to traffic in these animals, and as soon as it was really understood they were suffering from an infectious disease they were destroyed, and since then there had not been nearly so much tubercular disease in that part of the Colony. He mentioned this to show that by a little care and investigation they could give instructions to the people that would be of great advantage in the prevention of disease.

Dr. Taylor Young (Grafton, N.S.W.), as one of those to whom their professional brethren at Home had recommended Australia, said that when he came out he learnt for himself which part of Australia to go to, and thought the profession should try to find out not only how to prevent disease but how to prevent the wholesale dumping of consumptives down in Australia. If there was an epidemic of other diseases they endeavoured to go to the source, and why should they not do so here? He thought that as a Congress, they would do good to suffering humanity if they offered a united front and endeavoured to insist on their Legislatures doing something to prevent the introduction of consumptives to the Colonies. He had seen proof of the introduction of these sufferers on his way across from New South Wales to New Zealand. He found that even the shipping companies indiscriminately classed together in close cabins dying consumptives and young people in whom there was no trace of the disease. On the Manapouri, coming from Sydney to Auckland, there were three persons, all of whom had come out in the same ship of the Orient line for the benefit of their health. He did not wish to dishearten them, but he thought to himself that the medical men at Home must have desired to get rid of them. He knew also of a case from a well-known family who was shipped away from Home and died at sea, after which the sum of £3 was found in his pocket, it being evidently thought that that sum would be sufficient to last him while he lived. The speaker's experience as to the treatment of tuberculosis was too limited to enable him to speak authoritatively as to it, but he hoped the Congress would do their best to put before the world the fact that Australia was not the place for patients in late stages of consumption. Mr. Sydney Jones, of New South Wales, was now on the right lines for the early treatment of cases, as he believed that the endeavour to form model farms in the interior for such cases would result in many receiving benefit in the same way as, he hoped the Congress would agree with him, he had benefited.

Dr. Kenny (Melbourne) mentioned a case which came under his notice in the hospital in Melbourne. There had been a difference of opinion about the case. The physician who sent the case only suspected tubercular trouble, but was not inclined to diagnose it as such. The speaker had recourse to lactic acid and treated the case by every means in his power with absolutely no effect, although if ever there was a case for lactic acid there could not have been a more favourable case. Failing to get any result, he asked Dr. Springthorpe to satisfy his doubt as to the diagnosis, and to his surprise a dose of tuberculin caused the ulcer to break at once. That was in February, 1894, and on the day before leaving Melbourne he (Dr. Kenny) saw the patient. The ulcer was completely healed. Once or twice in the course of treatment small ulcers had formed in the vicinity or come on the healed parts, and invariably the injection of tuberculin had been followed by the healing of these ulcers. This case, he thought, spoke volumes for tuberculin where there was one focus of disease in which the course of events could be followed. The speaker instanced also a case of tertiary syphilis which was satisfactorily treated, and expressed the opinion that such definite, well-marked cases afforded valuable support to Dr. Springthorpe's contention in favour of tuberculin. It fell to the lot of throat specialists, Dr. Kenny added, to come across a great number of cases of tubercular laryngitis, the sufferings in which were such that he felt inclined every day to pray that his end might not come in that way, and he would be exceedingly grateful if members of the Congress would give him any information respecting remedies at their disposal for the relief of the acute and most distressing pain that accompanied that affection.

DR. WILTON LOVE (Brisbane) said they were doubtless all convinced of the formidable nature of the diseases they had to face, and it lay with them, if possible, to increase the prophylaxis and decrease the sources from whence diseases are derived. Veterinarians had told them, and pathologists were fairly well agreed, that the tuberculosis of animals and of man was identical. It had also been proved that it was from meat supply and milk supply that tuberculosis chiefly gained its introduction into the human system. With reference to the tuberculosis derivable from meat, the primary preventive surely was the efficient inspection of all slaughteryards, the grouping together of slaughteryards under the public abattoir system, and the thoroughly efficient inspection of all meat offered for public use ; and it was, if possible, more important still that there should be supervision of the dairies. In Canada and America they were far ahead of the Australian colonies in this respect. In Canada the dairy cattle were subjected to periodical examination by means of tuberculin. Veterinarians were satisfied that 97 per cent. of the cases of reaction with tuberculin showed tuberculous evidence in *post mortem* examination. In Germany the authorities had, as most of them knew, instituted the tubercular test, and this had been supplemented by the important addition of a vote of £10,000 from the Government funds for the compensation of the owners whose cattle were destroyed. The Central Board of Health in Sydney had instituted an examination on similar lines, and, he understood, paid thirty shillings a head for every beast which was condemned as tuberculous. He certainly thought that if the governments of the various colonies could be brought to recognise the immense amount of good which could be done by preventing the disease, both by the abattoir system, by efficient inspection of the meat supply, and by the supervision of dairies, the death rate from phthsis would in a few years be less than it was. The death rate from phthisis in Victoria and Queensland, which were unfortunately at the head of the colonial list, average from 12 to 14 per 10,000 per annum; in Great Britain it was about 16; and in New Zealand, which, he was happy to say, was low on the list, it was 6, 7 and 8 per 10,000. If the general public at Home were made aware of these figures he thought they would be less inclined to send subjects out here, and also if they were aware of the fact that, while the oldest practitioners said it was formerly very rarely that consumption was found amongst the native-born colonists, cases of phthisis were now just as numerous among native-born colonists as among foreigners.

Dr. Lindo Ferguson (Dunedin) thought it might be of interest if he laid specially before the Congress a couple of cases of a tuberculous nature. One was a case of tubercle of the eyes, which he removed some ten years ago from a girl who was then about eight years old. The girl was now walking about the streets, and, so far as one could judge, was in exceedingly good health. That was a case that tuberculin would not have got over. The other case was one of such rarity that he thought the Congress would like to examine it. It was a case of tubercular disease of the nose.

Dr. Hudson (Nelson) asked if the tubercle bacillus had ever been found in milk.

Dr. F. Wallace Mackenzie (Wellington) desired to draw attention to some incongruities which had cropped up in the discussion with the object of having them reconciled. They had been told that it was absolutely impossible to destroy the tubercle bacillus by boiling, and then they had been told that they should rectify milk by boiling it if it was suspicious. They had been told by Mr. Cameron that the pig was the only animal in the animal kingdom that suffered from tuberculous ulceration of the alimentary tract, and they had been told by Dr. Chapple that he had himself investigated a serious outbreak of disease in cattle characterised by a tuberculous ulceration of the alimentary tract. He thought it was due to the Congress that they should have some explanation of these incongruities. It was either a scientific fact that the tubercle bacillus could not be destroyed by boiling, or it was not a fact. If the bacillus could not be destroyed, why should they destroy the milk by boiling it? If they were going to boil their milk why should they not also boil their butter?

Mr. Cameron explained that he did not say that the pig was the only animal that was subject to tuberculous ulceration, but that it was the only animal that was subject to such ulceration as was seen in typhoid fever in man. Regarding another point mentioned by Dr. Mackenzie, he observed that since the introduction of the mechanical separation of milk tuberculosis in milk had increased enormously, and it was more prevalent in districts where "creameries" existed. Butter was found not to have in it bacilli to the same extent as milk had them.

Dr. Symes (Christchurch) thought it would be an advantage if Dr. Springthorpe would be kind enough to say whether tuberculin reaction occurred in any disease besides tuberculosis.

Dr. Mullholland (Melbourne) said it was not the practice at Home for medical men to send cases of phthisis to the colonies. Where cases of patients coming to the colony happened, it was done on the advice of friends and not on the advice of medical men. He had attended the hospitals in

Glasgow and London, and in no instance had he heard doctors say to their patients that they should go to the colonies. On the other hand, he had heard them tell patients not to go. He thought it necessary that the minds of gentlemen of the Congress should be informed of this.

Dr. A. Martin (Wellington) suggested that strong representations should be made to the Government to discontinue the issue of New Zealand bank notes and to close up all old clothes' shops.

Dr. Springthorpe said it seemed to be thought that, because he had shown what the tubercle bacillus could do, he wished to sound a pessimistic note. Nothing was further from his thought. He was one of those who believed that more people recovered from tubercle diseases than ever died from them, but tuberculosis was the biggest disease the profession had to cope with. With regard to the question as to whether tuberculin introduced a reaction in other diseases, he replied, that it was considered to be established by Professor Whittaker and others that a local reaction was proof positive of tubercular disease. So far as he knew there had been no actual case where no tubercle was present, but they must remember there were cases of mixed affection. He thought a local reaction was proof positive, but he said nothing about a general reaction. Under the condition in which bacilli occurred in milk it was found that boiling did destroy most, if not all. It was found that for practical purposes boiling or even scalding the milk had the effect of diminishing the number of the bacilli, and of reducing their virulence so that they did not get the result from boiled milk that they would get from unboiled.

The President remarked that there was one point which had struck him in the discussion. There was a certain interesting bill which had exercised the minds of the people in this colony, named the Undesirable Immigrants Bill. He was not quite sure whether, if the bill had been carried into law, they would have had the pleasure of seeing in New Zealand all who were present at the Congress, but it might be that after all there were some points in the bill which would be of great value to the country.

APPOINTMENT OF A COMMITTEE.

Dr. **Springthorpe** submitted the following resolution:—"That a sub-committee be appointed, consisting of Drs. Ogston and Grace (of New Zealand), Professor Watson and Dr. Hamilton (of South Australia), Drs. Knaggs and Worrall (of New South Wales), Dr. Love (of Queensland), Professor Allen and Dr. Syme (of Victoria), Dr. Sprott (of Tasmania), Dr. Lovegrove (of Western Australia), and the mover, with power to add to their number, to draw up and report to Congress for approval: (*a*) Printed slips of advice, suitable for general use by medical men in dealing with cases of phthisis. (*b*) Resolutions to be brought under the notice of the Governments of the different colonies, having as their object the general preventive measures deemed necessary for the prevention of the spread of tubercular disease."

Dr. Jennings (Christchurch) seconded the resolution, which was carried unanimously.

The Congress then rose.

At 2.30 p.m. the Sections again met at the University for the reading and discussion of papers.

Later in the afternoon members of the Congress were present (by invitation) at the opening of the New Links of the Otago Golf Club by His Excellency the Governor.

In the evening a ball was given in the Choral Hall by the President of the New Zealand Medical Association (Dr. Lindo Ferguson) and Mrs. Ferguson.

FOURTH DAY: THURSDAY, 6TH FEBRUARY, 1896.

At 10 a.m., in the Chemisty Classroom at the University, DR. SPRINGTHORPE (Melbourne), President of the Section of Public Health, delivered his Presidential address.

On the motion of DR. LOVE (Brisbane), a vote of thanks was unanimously accorded to Dr. Springthorpe.

The various Sections then met, and papers were read and discussed.

In the afternoon garden parties were given by Mr. George Gray Russell and by Dr. Brown at their country residences on the harbour side.

FIFTH DAY: FRIDAY, 7TH FEBRUARY, 1896.

At 10 a.m., in the Chemistry Classroom, DR. MORIER (South Australia) read the Presidential address, which had been prepared by Dr. Willis Way (Adelaide), President of the Section of Midwifery and Diseases of Women.

On the motion of DR. WORRALL (Sydney), a vote of thanks was unanimously accorded to Dr. Way.

At the conclusion of the address the various Sections met for the reading and discussion of papers.

Two drives were arranged for the afternoon of this day: one to the Wairongoa Springs, where lunch was provided by Mr. A. Thomson, the proprietor; the other to Blueskin, where Drs. Barnett and Fulton entertained the company at lunch.

A number of members also availed themselves of the special train provided by the Government, and paid a visit of inspection to the Seacliff Asylum.

In the evening the President of the Congress and Mrs. Batchelor gave a ball in the Garrison Hall.

SIXTH DAY: SATURDAY, 8TH FEBRUARY, 1896.

At 9.30 the adjourned General Meeting was held in the Chemistry Classroom at the University. Dr. Batchelor, President of the Congress, in the Chair.

THE PRESIDENT said that the first business was the choice of a place for the next meeting of the Congress, and intimated that a letter had been received from the medical profession in Brisbane inviting the Congress to meet in that city in 1899. He concluded by moving that this invitation be accepted.

DR. LOVE (Brisbane) seconded the motion. The medical men of Queensland would feel it an honour to have a visit to Brisbane from as many members as could there gather together; and though Queensland could not hope to rival the magnificent hospitality bestowed at this Congress, they would do their best to make all who attended feel at home. The year 1899 had been proposed as the year of the next Congress, and he would suggest that the time should be the winter. Brisbane had perhaps the finest climate in the world during the winter months, whereas the summer would, he feared, be found too hot for the comfort of visitors. Any month from May to October would do, and he should say that about July would be preferable. Fine weather could be pretty well depended on at that season. He cordially echoed the invitation forwarded jointly by the secretaries of the two medical societies of Brisbane. This year he (Dr. Love) had the honour of being elected President of the senior society, the Medical Society of Queensland, and as such it was his duty and privilege to support the invitation.

The motion was then put and carried unanimously.

On the motion of DR. GARDE (Maryborough, Queensland), seconded by PROFESSOR ALLEN (Melbourne), Dr. John Thomson, of Brisbane, was unanimously elected President of the next meeting.

On the motion of DR. SPRINGTHORPE, the resolution passed by the Public Health Section—"That the question of the Contagious Diseases Act be referred to the next Congress for discussion"—was adopted.

DR. SPRINGTHORPE brought up the following report of the sub-committee appointed to draw up resolutions dealing with the question of tuberculosis:—

(1) That this Congress expresses the opinion that it is unwise and cruel to recommend advanced cases of phthisis to seek Australasia as a health resort; that whilst there are many places in the different colonies of great climatic value in the earlier and curable stages, the coastal regions generally are to be regarded as unsuited for almost all stages. (Copies of this resolution to be forwarded to the English medical press.)

(2) That this Congress recommends for the use of medical men in their routine treatment of phthisis the printed table of advice and information originally drawn up by the Australian Health Society.

(3) That, recognising the serious extent to which tubercular disease prevails throughout Australasia, the fact that the disease is to some extent an infectious one, spreading through the medium of infected milk, meat, and air, this Congress begs respectfully to bring under the notice of the Governments of the different colonies the necessity which exists for the continuous and skilful inspection—veterinary as well as medical—of cattle and dairy stock, dairies, milk shops, and abattoirs; and for the proper disinfection of public spittoons, conveyances, buildings, &c., known or suspected to have become infected. The Congress also strongly urges the general use of tuberculin as a test for the presence of tubercular disease in dairy and other stock.

Dr. Springthorpe, in moving the adoption of the resolutions, stated that the sub-committee was representative of each colony, and that the resolutions were arrived at unanimously.

The motion was seconded by Dr. Ogston, and carried unanimously.

HYGIENE.

On the motion of Dr. Springthorpe, seconded by Dr. Ogston, the following resolutions adopted by the Public Health Section were confirmed :—

(1) That in the opinion of this Congress elementary hygiene should form a subject for instruction in all State-supported schools, and that where practicable teachers in such schools should be required to undergo a course of instruction in the same subject previous to their being licensed to teach.

(2) That this Congress respectfully begs to draw the attention of the different colonial Governments to the scheme by which the authorities of British India propose to deal with sanitary administration and the public health, with a view to the local adoption of such portion thereof as may be suitable to their respective requirements; and that they be respectfully asked to authorise a conference of their medical advisers empowered to report as to the best manner in which sanitary progress may be furthered.

TESTING THE VISION.

Dr. Lindo Ferguson brought up the following Report from the sub-section of Diseases of the Eye, Ear, and Throat on the subject of testing the vision of those employed at sea or on railways:—

The Congress urges:—

(1) That the Governments of the different colonies should take steps to ensure the proper testing of the vision of all men who are employed either at sea or in railway services whose duties are such that the lives of others depend on the acuteness of their sight either for form or colour.

(2) That all examinations of vision should be made by a properly-qualified ophthalmic surgeon.

(3) That a high standard of vision and perfect colour sense should be insisted on for all men who are engaged as deck hands at sea, and who have to undertake duty on the look-out or in steering. Also that such a standard be fixed for those engaged in the engine room as will suffice for their own safety and that of the ship.

(4) That a high standard be fixed for vision and perfect colour sense required in all deck officers of ships, that they be re-examined on each promotion, and after reaching the rank of master at intervals of five years.

(5) That the attention of the different Governments be called to the report of the Committee on Colour Vision presented to the Houses of Parliament in June, 1892, and to the report of the Council of the British Medical Association on the efficient control of railway servants' eyesight, published in the same year, and that the standards recommended in these reports be taken as the basis on which the requirements of vision should be framed.

(6) That the attention of the different Governments be specially directed to the law passed in the State of Alabama in 1887, dealing with railway servants' eyesight, entitled "An Act for the Protection of the Travelling Public against Accidents caused by Colour Blindness and Defective Vision," as a model on which suitable legislation might be based.

In order to put in a definite form the standard that should be aimed at, the Congress suggests that no candidate be allowed to enter the dangerous services unless he is free from any chronic inflammation of the conjunctiva or lids; he must be free from strabismus, and possess perfect equilibrium of the external ocular muscles; his distant vision must not be less than $\frac{6}{6}$ in one eye and $\frac{6}{9}$ with the other without glasses, the tests to be made with Snellen's types; he must have a perfect colour sense, tested both with Holmgren's wools and with distant colour tests under varying conditions; and he must also have a normal field of vision for both form and colour. Hypermetropia of more than one diopter should be a bar to entering the services.

Dr. Lindo Ferguson proposed the adoption of the resolutions. They were, he said, the result of a discussion in the sub-section dealing with this matter, and it was thought that if they were adopted by the Congress and forwarded to the Government they might pave the way to legislation which would add materially to the safety of the travelling public. Some of the instances given during the discussion were sufficient to make the hair of travellers stand on end. If the Congress adopted the resolutions it would be doing a service to the travelling public.

It was resolved that the resolutions be received and entered in the minutes of the Congress.

COMPLIMENTARY.

Professor Watson said: On behalf of every member of the Congress, and more especially the visitors from the Australian colonies, I wish to propose a vote of thanks to our president, Dr. Batchelor. His vigour, his firmness, and his courtesy have gained for him the esteem of all of us. The magnificent hospitality of Mrs. Batchelor has left an impression upon us which will long remain; and as for the doctor, I fear that he has done incalculable injury to his successors. This vote was carried by acclamation.

Dr. Batchelor, in acknowledging the vote of thanks, said: There are some very pleasant things in connection with this Congress that I shall ever remember, and which I can always look back upon as particularly gratifying; but if there is one thing more than another I appreciate and value it is the co-operation and support I have received from my fellow *confrères*, and I may especially lay stress upon the support I have received from the medical men of this town.

Dr. Knaggs said: Mr. President and gentlemen,—I have much pleasure in rising to propose a vote of thanks to the secretaries, treasurer, officers of sections, and local secretaries. I know full well what the work has been, having gone through the mill myself in the Sydney Congress, and I can thoroughly appreciate the very workmanlike way in which all the arduous duties of these officers and offices have been performed. I have not heard a single complaint of a letter missing or of anything going astray. Everything has been done in the most proper, official manner. I shall not delay you longer, but I hope you will by acclamation carry the resolution.

The vote was carried by acclamation, and was acknowledged by **Professor Scott**.

Dr. Sprott said: I have much pleasure in proposing a hearty vote of thanks to the Premier (the Hon. R. J. Seddon) and to the New Zealand Government generally for the very kind way in which they have received us. The action of the Premier and the Government in granting us free railway passes for ourselves and our wives has been a boon I am sure very much appreciated by every member of the Congress, of which we will show our great appreciation by our travels throughout the colony. I am sure we will get about as much as we can in the short time we have. To show our appreciation of this courtesy I beg to move a hearty vote of thanks to the Premier and Government of New Zealand.

Carried by acclamation.

Dr. Hocken said: I beg to propose that a vote of thanks be given to the Bishop of Dunedin for the eloquent and philosophical sermon preached to members of the Congress.

The vote of thanks was carried by acclamation.

Dr. Hayward moved—"That the thanks of this Congress be sent to the Chancellor and Council of the Otago University for the use of this building." The success, he said, of a meeting like this is so dependent on our environment that I am sure we must be thankful when we have a meeting place like this.

Carried by acclamation.

Professor Allen said: Gentlemen, I am sure the next motion will be one that will be received with the utmost enthusiasm; it is that a most hearty vote of thanks be accorded to all those who, as our hosts, have contributed so enormously to our enjoyment during our stay in New Zealand. Before we came here infinite pains were taken to provide for our reception and comfort, and during the time we have been here we have been overwhelmed with magnificent hospitality. Reference has been made to our great debt of gratitude to the President (Dr. Batchelor) of the Congress, and I am sure we shall always have a lively remembrance of what has been done for us by the President of the New Zealand Medical Association (Dr. Lindo Ferguson) and his most charming lady. With regard to the others I will not take up your time, but will propose a most hearty vote of thanks to those who have entertained us: To the Right Rev. Bishop of Dunedin (Dr. Nevill), Mr. A. Thomson, Mr. George Gray Russell, the Hon. W. H. Reynolds and Mrs. Reynolds, Mrs. Cutten, the Otago Harbour Board, the Dunedin Club, the Otago Club, the Dunedin Bowling Club, the Otago Lawn Tennis Club, the Otago Golf Club, the Dunedin Cycling Club, the Athenæum, and others.

Carried by acclamation.

Professor Allen said that the Congress were deeply sensible of the honour conferred by the presence of his Excellency the Governor, and a motion acknowledging the compliment of the vice-regal patronage was passed with cordiality.

Votes of thanks were also accorded to Dr. Roberts for piloting a party of medical men over from Milford Sound; to the editors of the *Australian Medical Gazette*, the *Australasian Medical Journal*, the *New Zealand Medical Journal*, and to the daily Press for reporting the proceedings of the Congress.

The meeting terminated with three cheers being given for Dr. Batchelor.

EXHIBITS.

Messrs. Burroughs, Wellcome and Co., of London; Messrs. Oppenheimer, of London, and the New Zealand Drug Company exhibited a large number of the newest pharmaceutical preparations. Messrs. Seegner, Langguth, of Auckland, and the New Zealand Drug Company had also very complete exhibits of the most modern surgical instruments and apparatus.

SECTION OF MEDICINE.

ADDRESS IN MEDICINE

By Alfred Austin Lendon, M.D. Lond.,
President of the Section.

Mr. President and Members of this Congress,—

When originally I was designated as one of the Vice-Presidents of the Section of Medicine, I accepted the position knowing that it was intended as a graceful act of Intercolonial courtesy rather than as a personal compliment to myself. I had no thought that the retirement of my friend Dr. Jamieson would lead to my promotion to the Presidentship, and thus convert a dignified sinecure into a post of anxious responsibility. And when I reflect upon the high standing in the profession of my predecessors in this chair, and when I recall the scholarly and eloquent addresses which they delivered, and, above all, when I consider what a treat we might have expected from so practised a writer and lecturer as Dr. Jamieson, I feel indeed the greatest misgiving, and therefore humbly crave your kind indulgence.

At the outset I should wish to record my regret that of the chief officers of this section at our last meeting two have since passed away. As to the President, Dr. Robertson, it was obvious that the hand of Death was upon him; but of the Secretary, Dr. Ralston Huxtable, who endeared himself to all with whom he came into contact, we little dreamt that he would have been cut off in his prime. Such a one must have been that friend of Virgil's, of whose early death another poet says:

> "Quis desiderio sit pudor aut modus
> Tam cari capitis."(1)

Thinking over the various subjects which I might take for my address, it occurred to me to invite your attention to the question as to the share which the general practitioner takes in the advancement of medicine, as contrasted with the work effected by those who devote themselves more to some special branch of our art; for it seemed to me to be more appropriate that one who is essentially a general practitioner should, in addressing those who, with few exceptions, are also engaged in general practice, select a topic of common interest.

What, then, I would ask, has the general practitioner achieved in the past, and what may we expect him to accomplish in the future?

It is a matter of general belief that most of, if not all, the advances of medical science emanate from those who are working in the more populous centres, and in a great measure this belief is justified; but I wish to show that we, the general practitioners, are not, and ought not to be, merely, as it were, middlemen engaged in retailing the benefits discovered by those who have greater opportunities for carrying on investigations in the ward or in the laboratory; that we have independent functions and ample opportunities for exercising them in our every-day practice; and that we may, nay ought, to assist in defining the principles and in improving the practice of medicine.

The best answer to the first part of the question I have propounded, and an additional reason for selecting this theme as my subject, immediately presents itself. The year 1896 is the centenary of a very great event—the introduction of vaccination by Edward Jenner, a general practitioner in an obscure town in the West of England.

It would be a great omission if this Congress were not to join the rest of the civilized world in celebrating what must be confessed to be the greatest discovery in preventive medicine of the last century, and I therefore esteem it a very great privilege to have this opportunity of attempting, however imperfectly from the slender means at my disposal, to briefly lay before you an account of Jenner and his times, and to review the work he accomplished.

Jenner's biographer,(2) Dr. Baron, laboured under some great disadvantages. He did not make Jenner's personal acquaintance till ten years after the publication of his celebrated "Inquiry," and although his work is of great value, obviously his admiration for his friend, and intolerance of any criticism of the discovery, tend to prevent his recognition as an impartial judge of the character of the man, and of the merit of his work.

The town of Berkeley, which in the middle of the last century had a population of about 500 inhabitants, is situate in the vale of Berkeley on the right bank of a river Avon (not the Stratford nor the Bristol Avon), about a mile from where it flows into the Severn. Like so many other towns that date from the feudal times, it probably originally grew up under the protection and shadow, as it were, of Berkeley Castle, the seat of a noble family of that name. The town is about sixteen miles south-west of Gloucester City, and the district has long been noted for its dairy farming. Here Edward Jenner was born on May 17, 1749. His father, Stephen Jenner, who died in 1754, was at one time tutor to the fifth earl of Berkeley, to whose father I imagine he was indebted for his presentation to the living of Berkeley, in which he succeeded his own father-in-law, and was succeeded apparently by his son Stephen, who seems to have acted the part of a second father to the youth Edward.

Another brother of Jenner's and two of his brothers-in-law were also beneficed clergymen, so that the family was one of eminent respectability, as the phrase ran in those days. The family possessed considerable landed properties in the western counties, where the name has been known for centuries, and the sons usually went to Oxford; indeed, Jenner remarked that he was the only one of a long line of ancestors and relations *(sic)* who had not been educated there. He was sent to a school at Wotton-under-Edge, and afterwards to Cirencester, where he developed a taste for natural history, for although a schoolboy might make a collection of nests of the dormouse, we should hardly have expected him to have been interested in oölitic fossils, as we read that he was. He left school at the age of fourteen, and it being decided that he was to enter the medical profession, he became apprenticed, as the custom then was, to a surgeon, Mr. Ludlow, of Sodbury near Bristol. In 1770 he went to London and spent two years as a house pupil with the celebrated John Hunter, who was then in his prime. His attachment to Hunter was very great, and the master's opinion of his pupil may be gathered from the many letters which Jenner preserved, and in one of which Hunter writes—"I do not know anyone I would sooner write to than you. I do not know anybody I am so much obliged to." His intimate association with Hunter must have tended greatly to mould his character, and undoubtedly it was the most fortunate element in his educational career. Whilst in London Jenner was engaged in arranging the natural history collection of Sir Joseph Banks, and he showed such skill and knowledge that he was offered the position of naturalist to Captain Cook's second expedition, which sailed in 1772. Need I remind this audience that he would then have visited these shores? However, he declined the offer and returned to Berkeley to practise in 1773. His correspondence with Hunter continued till the death of this famous surgeon, who once endeavoured to entice him to London by an invitation to assist him in teaching natural history, but Jenner resisted the flattering temptation.

We have an interesting picture of him when starting now on his professional career at the age of 24, drawn by a friend who first made his acquaintance at this time :

> "His height was rather under the middle size ; his person was robust, but active and well formed. In his dress he was particularly neat, and everything about him showed the man intent and serious. . . . He was dressed in a blue coat and yellow buttons, buckskins, well-polished jockey boots with handsome silver spurs, and he carried a smart whip with a silver handle. His hair . . . was done up in a club, and he wore a broad-brimmed hat. . . I . . . was not less surprised than gratified to find that the ancient affinity between Apollo and Esculapius was so well maintained in his person."

This last allusion to his artistic tastes is interesting. We gather from various sources that he was fond of singing, and able to perform on the violin and flute. Hunter's letters contain allusions to paintings which he had purchased for Jenner as a bargain, and several specimens of his poetic talent are extant. Perhaps the most striking thing we notice is the absence of any allusion in his letters to current political or social topics. He lived in stirring times—the latter end of the reign of George II. and the whole of that of George III. As a boy he would have heard of the retreat and execution of Admiral Byng, of Clive's victory at Plassey, and of Wolfe's heroic scaling of the heights of Abraham. In later years he might have heard Burke's brilliant impeachment of Warren Hastings in Westminster Hall: the episodes of the French revolution and the Napoleonic wars, the secession of the American Colonies, and the war of independence, surely these were everywhere discussed. But Jenner appears to have cared for none of these things: his verses breathe a love of country life and objects, and his letters seldom deal with other matters than that of his great discovery.

Chiefly at Hunter's suggestion, he carried out many investigations in natural history, one of which on the "Cuckoo" seems to have earned him the fellowship of the Royal Society in 1788. He anticipated Darwin in some observations on the earthworm, and he was an ardent geologist at a time when geology could hardly be reckoned amongst the sciences. His most famous paper on the "Migration of Birds" was not published till after his death.

In 1788 he married a lady of good family, named Kingscote, and about the same time his nephew, Henry, become his apprentice.

Meanwhile Jenner was not neglectful of his professional studies. He belonged to two small local associations, one of which he was instrumental in forming, which met in neighbouring towns, and contrived to blend a pleasant conviviality with academic discussion, much as this Congress is doing on a larger scale. Here he often advanced his views on cowpox inoculation—views which his *confrères* looked upon as a hobby; he amended pharmaceutical methods; and, above all, he explained the secret of Angina Pectoris. It was to this mysterious disease that his beloved friend, John Hunter—"the dear man"—succumbed in 1793. All these things, which of themselves would have made him accounted a distinguished man in his day, are overshadowed by the discovery at which he worked quietly for so many years, and which he brought to a successful issue on 14th May, 1796.

We must recollect that in the middle of the eighteenth century smallpox was mitigated by the method of inoculation, which was first introduced into England in 1722, through the advocacy of the Lady Mary Wortley Montagu, the wife of the then Ambassador to the Sublime Porte. By a process of selection an attenuated form of smallpox virus was communicated, and in the hands of some this practice was attended with but a slight mortality, although it had this disadvantage, that it was credited with diffusing the smallpox more extensively. His own preparation for inoculation is graphically described by Jenner in terms which recall the reply of Molière's Bachelierus(3) to his learned examiners—

"Clysterium donare
Postea seignare
Ensuita purgare
Reseignare, repurgare, et reclysterisare."

There is no doubt that inoculation usually prevented smallpox from effluvia, but after a time the degree of protection was lessened, so that cases of smallpox from contagion did actually occur in those who had previously been inoculated.

Jenner was attracted to the study of this question by a tradition which was prevalent amongst the dairymaids. When he was an apprentice, a young country woman's statement that she could not acquire smallpox, as she had already had cowpox, rivetted his attention. The latter was a disease which from time to time broke out as an epidemic amongst the cows, the chief features being some sores or vesicles on the udder, from which the milkers, if they happened to have cracked fingers, used to become inoculated. Veterinary science was not much studied in those days, and the cowpox, which was common in some districts, was unknown in others, and was generally confounded with the cattle plague. Jenner mentioned this notion to Hunter, who publicly alluded to it in his lectures, and encouraged his pupil to investigate its truth when he returned to the country. Jenner set to work and collected several cases of persons who, having had cowpox by accidental inoculation were found to be insusceptible of inoculation with smallpox virus. He next studied the disease of the cow, and he came to the conclusion, since generally thought to be erroneous, that the cowpox arose from a disease of the horse, known as the "grease," and he further concluded that this disease had to be transmitted to human beings through the cow, otherwise it had not the protective virtue, for men who contracted sores on the fingers from attending to horses with greasy heels were easily inoculated with smallpox; these sores were, therefore, probably ordinary septic processes. Jenner ascertained further that milkers might have cowpox more than once. The chief objection raised by those to whom Jenner first announced his opinion was that occasionally instances of smallpox occurred after accidental inoculation with cowpox, so that the rule could not be absolute; moreover, those who had had smallpox were not exempt from taking cowpox. Thus foiled, Jenner set to work again, and demonstrated that all the sores met with on the udder of the cow were not true cowpox, and, further, that it was only in a certain stage of the development of the vesicle that the true virus of cowpox could be communicated so as to be protective against smallpox. Milkers were liable to contract sores on their fingers which were not true cowpox.

In 1796 the climax was reached. A girl named Sarah Nelmes contracted cowpox on her hand, and on the 14th May Jenner inserted some of the matter taken from the vesicle into two superficial incisions on the arm of a boy named James Phipps. Six weeks later matter from a smallpox pustule was inserted into the boy's arms, but he was found to be proof against inoculation.

More recently (1889) Professor Crookshank has been at great pains to show (4) that Jenner's discovery was anticipated in the year 1774 by a Dorsetshire farmer named Benjamin Jesty, who deliberately inoculated with the cowpox his wife and two sons with the view of preventing the smallpox, having noticed that two dairymaids in his employ, who had accidentally contracted cowpox, had escaped infection when waiting upon sufferers during an epidemic of smallpox. As an historical fact this deserves to be known, but it in no way detracts from the merit of Jenner's work.

Jenner's pamphlet, "An Inquiry into the Causes and Effects of the Variola Vaccinæ: A disease discovered in some of the western counties of England, particularly Gloucestershire, and known by the name of the cowpox," was not published till two years later (1798), but within three years the practice of vaccination had spread to the continents of Europe, Asia, and America, and many of the laity contributed actively to the diffusion of a knowledge of the advantages of the discovery. To none was he more indebted, perhaps, than to the Countess of his patron, that Earl of Berkeley, the succession to whose title has formed one of the romances of the peerage in quite recent days.

A few years before these events occurred Jenner had become a physician and resigned the more arduous work of his practice to his nephew. His work now required his presence a good deal in London, and for a time he lived there; but after the death of his wife in 1815 he finally retired from active life, and remained at Berkeley for the rest of his days. He died of apoplexy on 26th January, 1823, and was buried in Berkeley Church. To the end he continued his natural history researches, his spare time being occupied also with magisterial and mayoral duties.

Had Jenner lived in the nineteenth century his services to humanity would, perhaps, have earned him the same rewards and titles as those usually accorded to a regal accoucheur, or even those so justly bestowed upon his distinguished namesake in our own day. The appreciation of foreign countries was soon declared: medals were struck in his honour; in Bavaria his statue was enshrined in a temple; diplomata were showered upon him. And although by his own country his merits were more tardily recognised, it can scarcely be said that his discovery was not appreciated, seeing that Parliament granted him £30,000 in all, and that the ancient universities vied for the honour of conferring a degree upon him, whilst Coleridge even meditated a poem. But no title could add to the lustre of his fame, no money grants could adequately represent the value of the lives he saved. The only danger to his reputation lies in the fact that this generation does not really know what smallpox meant a century ago, and hence parents, moved by their infants' tears, are easily persuaded that they do not "hold with" vaccination, and that it engenders all sorts of diseases in after life, as though skin eruptions and delicate health were unknown before the days of Jenner

It is not my intention to enter into details as to the reception vaccination met with, the opposition it evoked in some quarters, the manner in which its progress was impeded by imperfect attention to its proper performance, and the misrepresentations that were circulated as to its remote effects. Jenner lived to a ripe old age, but one regrets to think how his sensitive nature was constantly exposed to rude assaults at the hands of invidious contemporaries; however, he never wavered in his belief in the greatness of his discovery. It is true that he met with a serious check in 1811, when the case of the Hon. R. Grosvenor showed that the protection afforded by vaccination against smallpox did not last for all time; but, as Jenner pointed out, neither did the protection of inoculation prove absolute. It is true also that it is not possible to reconcile Jenner's statement in his letter(5) on this case with his statement in his original "Inquiry":(6) but at all events he modified his opinion to this extent, that he pronounced that vaccination gave as much protection as inoculation—neither more nor less,—and the experience of one hundred years fully bears out this statement. Since then nothing has been added to this great discovery, and nothing, I think, has been found to detract from it. Quite recently, too, an eminent veterinary authority has shown(7) that amongst the various diseases commonly known as the grease, there is an affection of a contagious nature—the true horsepox—which communicates to man and to the cow the true vaccine vesicle, and protects against smallpox.

Professor Crookshank's ponderous volumes were written with a view of showing that we are all quite wrong in our estimate of Jenner, and that vaccination itself is a delusion and a snare; but the only effect of a perusal of his book is to confirm us in our preconceived notions as to the greatness of Jenner's work, and it can, I think, be safely said that not only is there no evidence or argument adduced that can dispose of the statistical proofs of the efficacy of vaccination, but that by re-publishing in full Jenner's various papers this champion of the anti-vaccinationists—a sect mainly recruited from the ranks of those faddists or fanatics who despise logic and distort statistics—has done a real service to vaccination. Like Balaam, he has uttered a blessing instead of the looked-for curse.

Jenner may not have been as profound a philosopher as Harvey in the seventeenth century, or such an intellectual giant as Pasteur in the nineteenth century; but, as Dogberry hath it, "comparisons are odorous." The work Jenner did was essentially work of observation such as any general practitioner might carry out, and if we estimate its value by the saving of life, it probably has higher merit than the enunciation of the anti-septic theory or the discovery of anæsthesia.

But this reminds me that if this year be a great centenary it is also a great jubilee, for was it not in 1846 (October 16) that Morton first publicly demonstrated at Boston the marvellous anæsthetic properties of ether—and what was Morton? Two and a-half years before this date he had commenced his work as a medical student, supporting himself meanwhile by the practice of dentistry. He was only twenty-seven years of age when he perfected his discovery.(8)

Had I the time I could point to examples in Australasia of general practitioners who were but lately amongst us who have done distinguished work in the cause of medicine. Joseph Bancroft (*ob.* 1894) found time to combine with a busy practice the study of botany, and has immortalised himself by his observations on the Filaria named after him. The name of Henry Widenham Maunsell (*ob.* 1895) is associated as much in London as in Dunedin with advances in the technique of intestinal surgery. It would hardly be becoming for me to more than refer to John Davies Thomas (*ob.* 1893), my friend and former partner, whose work on hydatid disease is so widely known.

And what as to the future? What work is there for the general practitioner to do in the twentieth century to advance the science of medicine? The achievements of the past must be the augury for the future. The work that it is possible for him to do is boundless; it may not like Jenner's mean the saving of countless lives, but it will add to our common stock of knowledge. Can we suppose, for instance, that we have yet perfected the methods of physical examination of the chest? Can we flatter ourselves that we are approaching the solution of the difficult problems of brain physiology and pathology? Can we assert that our methods of treatment of pulmonary consumption are strikingly successful? It will probably be, as of yore, in the class of chronic or of hereditary diseases, or of those ailments which do not require hospital treatment, that the general practitioner will find his richest harvest, and personally I know of no more interesting study than that of those patients whose chronic ailments continue for many years under our observation. Many are the topics one might suggest for study—such as, the better means of discrimination between those varied forms of joint diseases such as we group under the denomination of "rheumatism," "rheumatic gout," &c.; the association between herpes zoster and nerve inflammation; between catarrhal herpes and mucous membrane inflammation; or the causes and treatment of eczema. One reason why the general practitioner is not doing so much to advance medicine in the present day is, I think, to be found in the voluminous literature, book and periodical, monograph and annual digest, with which he is supplied like so much peptonised mental food. It prevents his thinking out problems for himself. He becomes too reverent for authorities, and can scarcely believe the evidence of his senses if it conflict with what the books say. The authorities are not infallible, and medical knowledge is transitional; the theory hazarded yesterday is accepted as truth to-day, and may be disproved to-morrow. Let us question all authority—I do not say disregard it—as far as we are able, and doubt all the more the statement that is most dogmatic. Then shall we, the general practitioners, having shaken off the trammels of tradition and authority, be more likely to do our share in the advancement of medicine, as Jenner did his one hundred years ago.

REFERENCES.

(1) Horace's Odes. Book 1, 24.

(2) Life of Edward Jenner, M.D., LL.D., F.R.S., &c., &c., by John Baron, M.D., F.R.S. Late Senior Physician to the General Infirmary, &c., at Gloucester. 2 vols., 1838. Other writers, such as Bellamy and Russell, all draw upon Baron for their information.

(3) Moliere. Le Malade Imaginaire.

(4) History and Pathology of Vaccination, in 2 vols., a Critical Inquiry, by E. W. Crookshank, M.B., Professor of Comparative Pathology and Bacteriology in King's College, London. 1889.

(5) Letter to Miss Calcraft, p. 158, vol. 2, Baron's Life of Jenner.

(6) Crookshank. Vol. 2, p. 31.

(7) Professor George Fleming, C.B., in the Veterinary Journal for August, 1890.

(8) Century Magazine, August, 1894.

ON THE COMPARATIVE PROGNOSIS AND TREATMENT OF DIFFERENT FORMS OF CARDIAC DISEASE.

By JAMES JAMIESON, M.D.

Lecturer on Medicine—Melbourne University.

It is sometimes difficult to explain the varying results of treatment in cases of heart disease. Often, of course, an explanation is attainable, if not during life at least on *post mortem* examination; and there are general principles, by which we are guided, in respect both of prognosis and treatment. It may be that failure is inevitable, from the rapidity with which a lesion progresses, as in cases of ulcerative endocarditis; or merely as a consequence of advancing age, failure of general health, or the development of some complication. But independently of accidental complication or natural progression, it is possible to lay down some general rules which may be helpful, either in enabling us to forsee results, or guiding us in the selection of remedial agents. The adoption of routine methods is not often desirable; in cases of heart disease it is often positively disastrous. And so in regard to prognosis, it is not safe to attempt to make too hard and fast distinctions.

The difficulty, of course, is in getting a proper basis of comparison, so many elements entering into the calculation; differences in the kind and severity of a lesion, as well as in the health, habits, and constitution. There has, for instance, been diversity of opinion among authorities as to the comparative prognosis in cases of obstruction and regurgitation at the mitral orifice. Now it may readily happen that there is confusion of cause and effect in some statements made on this subject. For if it be true that cases of mitral stenosis often run a very chronic course, it is not because the condition is in itself less serious than in regurgitation of equivalent severity. The patient with stenosis may live for many years in fair health, because the lesion producing the symptoms is of slow development, and so there is time for the establishment of a proper equilibrium of forces on a new basis. In all mitral lesions this new equilibrium depends essentially on increased functional capacity on the part of the right ventricle, and, to a less extent, of the left auricle. Time and opportunity for the development of a proper measure of hypertrophy of the right ventricle are better given with a slowly produced obstruction of the mitral orifice than in a regurgitant condition, which is more apt to be produced quickly and further developed with comparative rapidity. For clearly the hypertrophy of the left ventricle, which comes on in cases of regurgitation, is of very mixed advantage. It is needed for the purpose of driving on, into the aorta, the large supply of blood coming freely into the ventricle; but a forcible left ventricular contraction must also drive blood back on the lungs and right heart, and so increase the liability to dilatation when there is any sudden stress. Practically it may be said that in all cases of mitral disease the prospect of any continuance of a fair measure of comfort depends on the ability of the right ventricle to respond to the new requirements laid on it; and that a breach of the newly-established equilibrium is so easily produced in mitral cases, is best explained by the essential feebleness of that part of the pumping apparatus.

It is difficult to make a comparison in different kinds of mitral lesion. This may seem to be even more the case when comparison is attempted of the effects of disease situated at the mitral and aortic orifices. The conditions are in many respects completely different. In the case of aortic lesions, the task of keeping up the balance of the circulation is not thrown, in any considerable measure, on the right heart, or at any rate only at a late stage. Whether the condition be one of obstruction or regurgitation, the circulatory disturbance is thrown almost entirely on the left ventricle, and so long as it can rise to the task, the pulmonary circulation need not be appreciably hampered or the right heart overloaded. So soon, however, as the left ventricle for any reason begins to fail, the process of back-working on the lungs and right heart shows its effects. Even when that failure is nothing more than inability to empty itself thoroughly, there will be pulmonary congestion, and after dilatation has advanced so far that the mitral valve becomes incompetent, the effects of the back flow on the right side will soon become manifest. So far as the right side of the heart is concerned, the position of affairs is now very much the same as in primary mitral regurgitation. But, from the point of view of general prognosis, it is clear that the condition is altogether a worse one. It is a breakdown of the whole cardiac apparatus, while very often in primary mitral disease there may be severe symptoms, with the left ventricle still in good working order, and the right only accidentally, and perhaps temporarily, overstrained.

If the question were to be put generally, as to the comparative prognosis in aortic and mitral lesions, it would be necessary to say that no definite statement is possible. And yet there are prognostic points, both interesting and important, which must be observed by those who give careful attention to cardiac pathology. It is quite common to find persons suffering from unmistakeable disease at the aortic orifice, and especially of an obstructive kind, who remain for a long time almost free from symptoms, and even able to lead an active life. They are not, like ordinary mitral cases, subject to dyspnœa on even slight exertion, and liable to complete disablement from acquiring some slight bronchial catarrh. The reason of this difference is due to the fact that the changes which go on in the heart, as the result of aortic valve disease, are much less complicated. Compensation consists merely in the production of such measure of hypertrophy of the left ventricle as the additional work thrown on it demands. So long as that is reasonable in amount there is no cause for the production of very troublesome symptoms of any kind. And if the general health keeps good, and no other cause of structural degeneration is present, that state of comparative comfort may continue for quite a long period.

But it is a further matter of common observation that when failure does occur in such a case the effects are apt to be much less remediable. In particular it may be said that in these aortic cases we rarely get from digitalis the rapid, and seemingly almost miraculous, results which are so common in the dropsy of mitral disease. Quite a number of points have to be taken into consideration before we can get anything like a satisfactory explanation of the differences just pointed out. Even severe symptoms are comparatively easily and quickly removed in so many cases of mitral disease, because they come under treatment at quite an early stage. The disturbance is still almost entirely of mechanical origin, the muscular structures of the heart are still sound, and so we see such striking good results from rest, aided by some saline or mercurial purgative to lessen venous engorgement, and some cardiac stimulant, digitalis, or one of its substitutes. In aortic cases, on the contrary, by the time dyspnœa and dropsy supervene the case is generally at quite an advanced stage: both sides of the heart have given way, and the muscular structure has already undergone some degeneration. No treatment, however well selected or carefully carried out, can be expected to work marvels under these circumstances, and when relief is got it is too often in but a temporary way.

And there is another reason why aortic cases often refuse to yield to treatment. Whether the disease commenced in the valves or in the aortic wall, there is a tendency, as it progresses, to implication of other parts of the arterial system. This is the case, in a very marked way, with the coronary arteries; and, from loss of elasticity in their wall, diminution of calibre, or thrombosis, the nutrition of the heart muscle may be seriously lowered and extensive degeneration produced. And the implication of the arterial system may manifest itself, not merely by organic change in the walls by thickening and atheroma, but by a tendency to production of spasm. It will very often be found that three things concur in these cases, some disease of the kidneys interfering with their secretory function, some arterio-sclerosis, and this element of spasm. It is not easy to be sure in what order these conditions present themselves, and there is no clear relation of proportion between them.

Some kidney disease may be present in most cases, but it need not be in a very advanced form; and, as regards the arterial condition, it is certain that in one case the element of spasm is more prominent than is that of thickening or sclerosis of the wall; while, in another, there may be very marked organic change, without evidence of the occurrence of spasm. Now this element of spasm of the arterioles in connection with aortic disease is of extreme importance in symptomatology and prognosis. When the peripheral arteries are extensively involved, the left ventricle has a great increase of work perhaps suddenly thrown on it. Hypertrophy may be produced in high degree, but, in spite of this, there is alway a tendency to overloading and dilatation, with great distress of an anginal kind. And there is good reason to suppose, further, that this spasm not uncommonly affects the coronary arteries themselves, and that the feeling of oppression in the region of the heart, almost worse than pain, and which is quite different from the distress of dyspnœa exhibited by the mitral patient, is really in some cases due mainly to this. It is, indeed, an angina pectoris added on to the effects properly ascribed to the organic disease of the heart and aorta, and increasing greatly the patient's distress as well as the danger. And with so many elements entering into the production of symptoms, it becomes tolerably plain why aortic cases, at the stage of failure of compensation, are so apt to be unmanageable as compared with the average mitral case, which superficially may seem to be far more serious.

The question of treatment in cases of heart disease may be quite as difficult as that of prognosis. Digitalis may not be often out of place in mitral disease with failure of compensation; but in aortic cases it has often to be used with extreme caution, and may even cause aggravation of symptoms. The state of the pulse still supplies, as it did to the older physicians, the best guide as to its safe administration. When that is small and firm it may be said generally that digitalis is contra-indicated, and is more likely to do harm than good; and it can rarely be the case that it is indicated, or is likely to be useful, when the heart contracts strongly and regularly. With respect to aortic cases, except in the temporary breakdown from dilatation in the presence of regurgitation, it might almost be said that digitalis is not wanted early, and when needed is apt to be as powerless, for more than very temporary good, as other remedies.

In the earlier stage, when, in spite of hypertrophy, there is dyspnœa and general distress, with or without any considerable amount of dropsy, vascular relaxants sometimes show themselves extremely useful. Nitroglycerine and the nitrites, and in other cases pilocarpine, may be found to give great relief to symptoms; and in an occasional case the same remedies may be given in conjunction with digitalis. And, perhaps, in the whole field of practical therapeutics, there is nowhere better opportunity for the display of skill and discrimination than in the administration of these different remedies, singly or in combination.

From the use of saline purgatives and mercurials, again, much benefit is to be got, and in very many cases of heart disease. They may do good in either of two ways—by relieving venous engorgement, and especially, therefore, in mitral cases with dropsy. The good effect is produced more by leading to a better distribution of blood over the whole systemic circulation, than by any mere cathartic or depurative action. But they may also be useful by causing arterial relaxation, though this is much less marked than in the effect produced by pilocarpine or the nitrites. Brisk purgation, by calomel or by salines, may be useful, therefore, in aortic cases, even when there is little dropsy. Among remedies which are sometimes very useful, and especially in cases attended with dropsy in considerable measure, I have had repeated occasion to be pleased with the action of diuretin. It has been said to act as a direct stimulant to the kidney; but it is especially, though not solely, in cases of cardiac dropsy that it shows its beneficial effect.

The following case may serve to illustrate several points which have here been referred to, and may be interesting both from the point of view of prognosis and treatment.

A. N., aged 54, a stevedore's labourer, was admitted to the Alfred Hospital on 1st April, 1895. He stated that he had been quite well till 18 months before, when he caught cold and began to complain of difficulty of breathing, which continued after the cold passed off. There was no account of previous illness except rheumatism twenty-five years ago. He had attended as an out-patient at the Melbourne Hospital for five months. About the beginning of the year his feet began to swell, and on account of the increasing swelling and pain in his feet he was admitted to that hospital in the end of January. The swelling disappeared and he was discharged, after a stay of six weeks. The symptoms quickly returned, however, and he was admitted under my care. He complained of considerable dyspnœa, and his legs were a good deal swollen, there being also some œdema of the hands. I found him sitting up in bed and a good deal distressed, though the breathing was not actually much laboured. But he had a distressed, anxious look, and it appeared that he had been sleeping badly. His pulse was 66, moderately full, and firm, and though there was a suspicion of sharpness in its stroke it had not the marked Corrigan character. Neither was there great visible pulsation in the arteries of the neck or limbs, though capillary pulsation was plain when a streak was produced on his brow. On inspection of the chest there was not found abnormal heaving at the region of the heart, the apex beat being found in the fifth intercostal space and in the nipple line. The area of cardiac dulness was somewhat increased. On auscultation the only distinct abnormality discoverable was a moderately loud diastolic blowing, heard best down along the sternum. There was no accentuation of the second pulmonary sound, and the mitral sounds were clear at the apex and to the left of it. A slight friction sound was heard in the second and third intercostal spaces to the right of the sternum.

The diagnosis was aortic regurgitation, though the symptoms were not in all respects characteristic of a severe lesion at the left orifice. On admission the urine was found to be acid, sp. gr. 1020; no albumen present.

His bowels were well cleared out, and he was put on strophanthus, three tabloids, three times a day. On the 7th there was no improvement: the dyspnœa about the same, but the œdema increasing; and he passed only twelve ounces of urine that day. He was then put on strophanthus—the original tincture sent out by Burroughs, Welcome. But as, after three days more, there was still no sign of improvement, and the pulse was, if anything, smaller, it was decided to try a few doses of nitro-glycerine, $\frac{1}{100}$ of a grain. The breathing seemed to be a little easier for a day or two; but the urine, which had averaged about 20 ounces, fell to little more than 10 in the day. The nitro-glycerine was therefore reduced to $\frac{1}{200}$ grain, in combination with five minims of tincture of digitalis. On the 17th there was still no sign of improvement, and as he had become noisy, he had to be removed from the large ward. A fresh start was then made in treatment. He got two grains of calomel every four hours for six doses, and then diuretin in doses of twenty grains, and afterwards thirty grains thrice a day. On the 16th the urine passed was only 8 ounces, and on the 17th only 11; but on the days following it rose successively to 47, 80, 112, 162, 97, 92, and 70 ounces. His whole condition at the same time improved remarkably, and his pulse notably increased in volume. He was so much better, in fact, that he was carried back to the large ward, where he slept quietly, and had very little discomfort for a few days. Soon, however, he began again to go downhill; his dyspnœa and restlessness returned, and on the 28th his urine was again only 14 ounces. The diuretin got trial again, but with only slight and transient effect, and for two days the nitrite of sodium was given in five-grain doses every four hours, with the hope that an increase in the volume of the pulse, such as accompanied the previous improvement in his condition, might again appear, but without benefit. As there were increasing signs of heart failure, strophanthus, with stimulating mixture, was again appealed to, but without effect. On 24th May he was failing rapidly, cyanosis becoming pronounced, and restlessness great, and he was given half an ounce of infusion of digitalis for three doses at four hours intervals. He rallied very much for a few days, the same remedy being given thrice daily, but there was not much increase in the flow of urine, and from the 29th he again became steadily worse, dying on the 31st, after having been for some time almost comatose.

Post mortem examination, made by Dr. Brett, showed fluid in the peritoneal and pleural cavities, and also in the pericardium. The heart was considerably enlarged, and weighed, when freed from blood, 22 ounces. The aortic valves were somewhat thickened, but otherwise intact, the other orifices being normal. The muscular structure was well coloured and firm. The aorta was rather dilated, and covered, all over its inner surface, with atheromatous patches. Both coronary arteries exhibited similar degeneration till they were fairly within the muscular wall, when they appeared to be quite normal. Part of the wall of the left coronary had passed into the calcareous condition. Both vessels were easily permeable to a good-sized probe. The kidneys showed no sign of disease, and the liver was not much enlarged, though it showed signs of commencing "nutmeg" condition.

The interest of the condition was mainly in the state of the left side of the heart and of the aorta. From the appearance of the ventricle and the condition of its arterial outlet, it did not seem as if they supplied a satisfactory explanation of the severity of the symptoms and their persistent aggravation. The ventricle was not in bad working order; the dilatation of the artery was not great enough to reveal itself by pulsation or other physical sign; and there could not have been a large reflux of blood through the valves, which were quite soft, though rather thickened. There was of course the interesting observation made that, at the time when such marked improvement took place, there was a distinct increase in the volume of the pulse. It is not known that diuretin is an arterial relaxant, and it might be that, by the diuresis which it produced, there was a double clearing of the blood of waste poisonous material as well as of water, and that arterial relaxation was the result of lessening of some toxæmic condition.

The great distress which this patient exhibited, which was not simply dyspnœa, and which had not an evident explanation in signs of dilated heart and cyanosis, caused the suspicion that he actually suffered from a kind of chronic anginal condition. It is not going too far to suppose that there may well have been, at these times of special aggravation of condition, some constriction of the coronary arteries themselves beyond the point where they were obviously diseased. A large probe was freely admitted well along their course, and, besides, the muscular condition was not such as should have been found if there had been chronic starvation from habitual insufficiency of blood supply.

Another interesting point to be noted is the failure of both digitalis and strophanthus at one stage, and the very striking if temporary effect of large doses of the former near the end. The explanation, I presume, is that at the late stage the heart was still capable of stimulation, while the period of arterial overaction was past. And, of course, the general observation is a safe one—that just as diuretin lost its effect after having done such marked good, so any other remedy could have had only a transient influence for good.

In a paper entitled "Cases in which digitalis does not agree," read by me before the Medical Society of Victoria, and published in the *Australian Medical Journal* for November, 1892, I gave details of two cases, with severe symptoms of cardio-vascular origin, dropsy and dyspnœa, in which digitalis seemed rather to aggravate the symptoms. It was tried and tried again as a kind of desperate resource. In the first of the cases, in which there was chronic nephritis, with rapid development of hypertrophy of the heart, quite a remarkable effect for good on all symptoms, followed the subcutaneous injection of pilocarpine in doses of $\frac{1}{6}$ to $\frac{1}{4}$ grains. Dyspnœa was relieved, and increased diuresis produced after perspiration ceased, the pulse at the same time almost doubling in volume. When the treatment, though so manifestly useful, had to be stopped, owing to the flagging of the heart's action and the appearance of signs of œdema of the lungs, dropsy and dyspnœa again increased, the pulse at the same time becoming small and firm. Nitroglycerine, in doses of $\frac{1}{100}$ grains daily, acted somewhat similarly to the pilocarpine in giving volume to the pulse and considerable relief to the dropsy and embarassed breathing; but the depressant action compelled its cessation. Pilocarpine, also, when tried a second time had to be given up after the administration of a single dose, and ultimately death was caused by heart failure.

The other case was that of a man, aged 65, who had suffered from steadily increasing dyspnœa for several months, with œdema, chiefly of the legs, for some weeks. When seen he had signs of cardiac hypertrophy, but no bruit; the pulse was rather irregular and intermittent; the urine contained a little albumen; and there were moist sounds at both bases posteriously. He was put first on tincture of digitalis, 10 minims, afterwards reduced to $7\frac{1}{2}$ minims three times daily; and though the œdema lessened, the dyspnœa showed no improvement. The pulse, though slower, was still intermittent, and he became extremely restless and noisy. Albumen was never present in considerable amount, and at times entirely disappeared; and the urine was generally in fair amount. But the dyspnœa became more severe, the skin began to take on a livid appearance, and the pulse became small and weak. It was decided to try the effect of venesection, and he was bled to 12 ounces with marked relief to all symptoms. But as he became rapidly worse again, bleeding was repeated to the extent of 16 ounces a week after. Again there was great relief; he slept better, and the amount of urine increased considerably, on one day to as much as 100 ounces. After about three weeks, however, he was almost as bad as before. Further bleeding not seeming admissible, pilocarpine was tried, $\frac{1}{6}$ grain, subcutaneously, but without good effect, and digitalis was equally powerless. He died a few days after, with great dyspnœa and cyanosis, though dropsy never became extensive. *Post mortem* examination revealed a greatly hypertrophied condition of the heart, which weighed 30 ounces; but though the ventricles were dilated, the muscular structure showed no sign of degeneration, and there was no sign of valve disease. But the kidneys did not, as perhaps might have been expected, show signs of disease, and there can hardly be doubt that the condition was one of constriction of the arterioles, widely distributed, and sufficient by its persistence to cause the hypertrophy, and, that being insufficient, the dyspnœa, cyanosis, and other signs of circulatory disturbance.

Of course, these two were not cases either of cardiac or aortic disease, but they are of interest in connection with the present discussion as showing the importance of the element of spasm of the peripheral arteries, which I have referred to as helping to account for the unmanageable character of certain cases of disease implicating the aortic orifice, as contrasted with others in which disease is seated at the mitral orifice. All three cases are also of interest, as showing how needful it sometimes is to apply measures of treatment radically different from any routine stimulation of the heart, whenever it seems to have lost its power to carry on the circulation in an efficient way.

As to the value of diuretin in some cases of cardiac dropsy I may be allowed to refer further to a paper entitled, "Notes on the action of some Diuretics," which appeared in the *Australian Medical Journal* for October, 1894.

AN INTERESTING CASE OF DIABETES MELLITUS—CANCER OF PANCREAS: PROTOZOA OF CANCER.

By Gregory Sprott, M.D., D.P.H.

Resident Surgeon, General Hospital, Hobart, Tasmania.

J. B., aet. 43, miner, unmarried, was admitted on 28th February, 1894, into General Hospital, Hobart, under the care of Dr. Bright, suffering from severe abdominal pain, diarrhœa, frequent micturition, &c. His present illness began about eight months ago, when he noticed he was losing flesh and was not quite equal to his work. On 31st October, 1893, he was admitted into the Launceston General Hospital and treated for diabetes mellitus. He remained under treatment till 16th January, 1894, when he was discharged relieved. He then went into the country to stay with some friends, but gradually grew weaker, and was admitted into the institution on above date.

Previous to July, 1893, he had always been a very healthy, strong man, of sober and temperate habits. He suffered no injury of any kind, and could in no way account for his illness except that "it gradually came of itself."

The family history showed a predisposition to cancer. His father died at 49 years of cancer of stomach; mother died at 55 years of cancer of uterus. Paternal grandmother died of cancer of tongue, as also did one of his father's sisters. Had only one brother and two sisters, all living and well. There was no history of phthisis nor of nervous disease in the family.

On admission he looked extremely emaciated; complained of great weakness and excessive thirst. He stated that within the last eight months he had lost 2st. in weight. Pulse was thready, and the temp. 97° F. The abdomen was distended, and there was a good deal of ascites. Liver could be made out enlarged, but no other tumour was felt. Hæmorrhoids were protruding, and painful to the touch. Urine was clear, alkaline; sp. gr., 1030; containing sugar roughly estimated at about 20 grains to the ounce. No albumen.

The case was considered as one of diabetes mellitus, and the usual dietetic treatment adopted, with a grain of codeia three times a day. The urine was measured daily, and ranged from 150 to 15 ounces in the 24 hours. During the last three weeks of his illness the diarrhœa became very troublesome. This no doubt accounted for the small quantities of urine collected. Sugar was present in the urine up till a couple of days before death, when it was last tested.

There was nothing unusual about the stools save being thin, fluid, and of a pale clay colour. The ascites, as well as the œdema of the feet and legs, got worse. He became gradually weaker, and died on 22nd April, 1894, being conscious up to a few hours before his death.

At the necropsy the following day I found a large quantity of serous fluid in the abdomen. The intestines were much distended with gas, liver enlarged, and on its upper surface a hard nodule about the size of a marble. Kidneys were slightly congested. The pancreas was the seat of a hard tumour about the size of a duck egg, to which was adherent several coils of intestine and omentum. All the other organs looked healthy. The pancreatic tumour involved the whole of the gland, and one section was hard and cirrhotic, of a yellowish colour. I took some fresh scrapings from the tumour at once for microscopic purposes, and then fixed the remainder of the tumour, cut into small pieces, as well as the nodule in the liver, in a corrosive sublimate solution with ·75 per cent. common salt. The sections were then prepared in the usual way adopted by Ruffer and stained with the Biondi stain.

On microscopic examination there was no doubt as to the cancerous nature of the tumour.

The glandular structure of the pancreas was for the most part destroyed and replaced by a fibrous stroma. The alveoli were broken up, and in this somewhat irregular epithelial structure I could easily recognise numerous intracellular bodies which I had recently seen described by Ruffer, Steven, and others in the *Journal of Bacteriology*. I will not enter into a discussion here as to what these bodies are, but will content myself with describing their appearance under the microscope. They were fairly numerous, and were easily distinguished from the cancer cell nuclei. With the Biondi stain the parasites or bodies were either almost colourless or a pinkish colour, the capsule and the nucleus of the parasite stained deep red. The cancer cells were also reddish coloured, but their nuclei stained bluish green and their nucleoli red. In only one instance could I make out anything approaching the Cambridge blue stain of the parasite which Ruffer shows amongst his first drawings. In size the parasites varied very much. The largest ones were seen in the scrapings. A very large body occupied the whole of the cell—only a small rim of the cell being seen outside the green nucleus. This parasite measured 25 mm. under the $\frac{1}{12}$ oil immersion Apochromatic Lens. Where there were more parasites than one in the cell the bodies were smaller; but whether the parasites were large or small, their general appearance and staining reactions were the same. In most cases only one parasite could be seen in the cell, but two and three were not uncommon, and as many as five were observed. The position of the parasite was intracellular. In not a single instance were they seen in the fibrous stroma nor outside the cancer cell. In some instances the parasite occupied the whole cell, in other cases the bodies had a central position, pushing the cell nucleus to one side.

In one place we have a small parasite surrounded by three fragments of cell nucleus, while in another we have a small parasite in the centre of the cell nucleus. The parasite in this instance stained pinkish, and in contrast to the bluish green of the cell nucleus.

It would appear from these two figures that the body may invade or originate in the cell nucleus, and by breaking up the nucleus escape into the cell. In structure the parasite was made up of a capsule surrounding the protoplasm, in the centre of which was a nucleus. The capsule with the Biondi stained a deep red, and was always sharp and well defined. It stained of a deeper red than the protoplasm of the parasite—in fact, more the colour of the nucleus of that body. In some instances the protoplasm of the parasite was almost transparent. In one instance it was a pale blue, but generally it stained pink. As a rule the bodies were circular in shape, but where there was more than one in the cell their outline was irregular. The nucleus of the parasite was for the most part central and stained deeply red, but in some cases the nucleus was nearer the side than the centre. In the liver section only two parasites could be seen in one cell. This cell was close up to the invading edge of the diseased tissue.

I have been careful not to note anything except what I was quite sure of under the microscope after examining several sections of the pancreatic tumour, and if the drawings resemble each other to a great extent it is because I was anxious to produce only typical specimens of which there could not be any doubt. Since these notes were made for another purpose, I have received a report from Dr. Steven, Pathologist, Royal Infirmary, Glasgow, to whom I sent a couple of slides for his opinion. He says: "You have managed your sections admirably. . . . I am not quite sure whether they should not be called colloid cancer, but I will not insist upon that; that they are cancerous is undoubted. Unfortunately the liver has too thick a cover to permit of my examining it with the $\frac{1}{18}$ oil immersion lens; the other two I have carefully examined. In the pancreatic tumour there are numerous 'inclusion bodies' quite similar to those I have described myself, and which, I believe, are the same as those depicted by Ruffer, Soudakewitch, Galloway, Cattle, and others. For the most part they are perfectly circular in outline, intracellular in position, have a red nucleus, and a red capsule."

REMARKS.

This case seems worthy of notice for several reasons:—

Firstly.—The well-known bodies described by so many observers as parasites of cancer were present, but so far as I know this is the first instance of the bodies being seen in the pancreas. It is noteworthy that the bodies described bear a very striking resemblance to those described as occurring in other organs. The nature of these bodies is still a matter of opinion; some believing they they are sporozoa and the cause of cancer, while others hold they are the products of cell degeneration. The recent investigations demonstrating that the malaria parasite is the cause of ague go a long way towards confirming the suspicion that cancer is also caused by a parasite. It is to be hoped the good work being done by D'Arcy Power, Shattock, Ballance, and others, will in the near future assist us in arriving at some feasible explanation as to what seems to be one of the mysteries of medical science—the true cause of cancer.

Secondly.—Primary cancer of pancreas is by no means a common disease, although of late years several cases have been reported; some of these being associated with diabetes mellitus, and others not.

Thirdly.—The case was regarded clinically as one of diabetes mellitus, but turned out (*post mortem*) to be cancer of pancreas. Diabetes has been known to be in some way associated with lesions of the pancreas for some time past, but only within the last few years has it received the attention of experimental as well as clinical physicians. It seems undoubted that there is a causal relationship between lesions of the pancreas and glycosuria.

Frerichs found that in 20 per cent. of his cases of diabetes changes had taken place in the pancreas.

Rokitansky states that in thirteen cases out of thirty the pancreas had become altered so as scarcely to be recognisable.

In the Bradshaw lecture, 1890, Saundby reported fifteen cases, and in only four of these was the pancreas healthy, while in only two were other other organs affected that would be likely to produce diabetes.

Vaughan Harley found in twenty-four cases, that in only three of them was any other organ than the pancreas affected that might have produced diabetes.

In twenty cases of Dr. Lapierre's, the pancreatic gland was destroyed in fourteen of them.

Williamson states that 50 per cent. of his fourteen cases could be attributed to pancreatic lesions, while Hansemann stated at the Congress at Rome that "he believed diabetes might exist without disease of the pancreas, but in 50 per cent. of all cases diabetes was associated with lesions of the pancreas."

Surely, then, the existence of pancreatic lesions in so many cases of diabetes is more than a coincidence. True, we have a number of cases of diabetes in which no lesion can be found. Nay, more; Dr. Rankin reports two cases of extensive disease of the pancreas, and yet no sugar was found in the urine; while Professor Ruggi, of Bologna, we are told, removed the whole of the pancreas, and the patient recovered.

Nevertheless, the experiments of Von Meyring, Lancereaux, Lepine, and others, show clearly that the amount of sugar in the organism is regulated by the action of the pancreas in some peculiar way.

What is then the part played by the pancreas in the body relative to the glycogenic process? Formerly we were taught to look upon the pancreas as one of the ordinary secreting glands which supplied the pancreatic juice with its three-fold digestive ferment; now we learn that besides the ordinary alveoli secreting the pancreatic juice, we have islets of epithelium-like tissue occurring throughout the organ in isolated patches. These islets are peculiar to the pancreas as a secreting gland, and are characterised by their extreme vascularity. Their function is to secrete a peculiar secretion known as the "internal secretion," in contradistinction to the external secretion, or pancreatic juice. This internal secretion, or glycolytic ferment, is carried into the blood by the lymph corpuscles, and thence to the tissues, where it, according to Lepine, destroys the sugar.

It has been shown by experiment that this ferment, or internal secretion, is quite distinct from the ordinary pancreatic juice, and that its secretion depends upon these islets of epithelium-like tissue already mentioned.

Neither ligature of the canal of Wirsung nor the diverting of the pancreatic juice by a fistula will produce diabetes. No more will destruction of the ordinary secreting structure, as shown by the experiments of Schiff, where he injected paraffin along the ducts.

It cannot be, then, as was once supposed, that the diabetes is due to the absence of the pancreatic juice in the intestine.

On the other hand, total ablation of the pancreas is speedily followed by diabetes mellitus, but Minkowski, Thiroloix, and others, have shown that if a piece of the pancreas be grafted successfully on the peritoneum, or under the skin, then removal of the pancreas is not followed by diabetes. Should the graft—which may, indeed, be no more than a gramme in weight—be now removed, then a violent glycosuria supervenes. The prevention of the diabetes by the graft, after removal of the pancreas, does away with the idea of Klebs, that glycosuria was due to injury or disease of the cœlia plexus, but it also shows that we may have an extensive atrophy of the gland secreting structure, and yet no diabetes—that is, so long as these islets are not destroyed.

It seems to me that Lepine's theory is the correct one, and that the diabetes mellitus in pancreatic lesions is due to the absence of this glycolytic ferment in the organism. Whether it acts, by preventing the excessive formation of sugar by its direct action on the hepatic cell elements through the blood and nerve centres, as suggested by Kaufmann, or whether it acts as a sugar destroyer in the tissues, as Lepine thinks, is an open question.

In whatever way it does act, the conclusion one naturally comes to is this—that it does in some way prevent diabetes mellitus; and its absence, either by removal or complete destruction of the gland, as in the case I have brought before you, is followed by a diabetes mellitus.

It is just possible that in many of the cases of diabetes in which we discover no lesion, the sugar in the urine may be accounted for by some peculiar interference with the functions of the pancreas through the nervous system.

In conclusion, I thank Dr. Bright for permission to bring the case under your notice, and also my friend, Mr. A. Park, for his great assistance in preparing the sections for the microscope.

THE COLD BATH TREATMENT OF TYPHOID FEVER IN COUNTRY PRACTICE.

By H. Rabl, M.D., Murtoa, Vic.

A well-known auther on typhoid fever demands that the mortality from it should not materially exceed 5 per cent.; therefore, if you can conscientiously show that your mortality kept at or below this limit, you can claim to have successfully treated it. During my studies at the university I had the opportunity of witnessing the two principal kinds of treatment—the one with medicines and the one with baths,—and I must say I was at once so favourably struck with the results of the latter that I firmly resolved to adhere to it for lifetime.

The arguments against the bath treatment are summarised in the following way:—"It is all very good in well-equipped hospitals, where you have skilled nurses and perhaps a resident surgeon always at hand, but in the country practice it is not practicable."

In the following I try to depict my own experience with the bath treatment during the past eleven years. In this time I had to treat 178 cases of typhoid fever. A few only of these received no baths, because they ran a subfebrile course, while about 170 were strictly treated with baths. Of these 178, eight died—a mortality of 4·5 per cent.

					Cases.	Mortality.
There occurred in	season	1884-85	...	...	15	1
,,	,,	1885-86	...	...	41	2
,,	,,	1886-87	...	...	10	1
,,	,,	1887-88	...	...	9	...
,,	,,	1888-89	...	...	3	...
,,	,,	1889-90	...	...	18	...
,,	,,	1890-91	...	...	8	1
,,	,,	1891-92	...	...	28	1
,,	,,	1892-93	...	...	4	...
,,	,,	1893-94	...	...	28	1
,,	,,	1894-95	...	...	14	1
Total ...	...	...	...	...	178	8

There are great fluctuations numerically between the different years. The numerical increases correspond with specially dry seasons—droughts—such as we experience here in the Wimmera from time to time, and are in accord with Von Pettenkofer's dictum: "The typhoid fever morbidity is at the inverse ratio to the humidity of the soil," or, with certain restrictions, "The typhoid fever morbidity is at the inverse ratio to the rainfall," I purposely avoid the term "variations of the subsoil water" (grundwasser schwankungen), because that term has been misinterpreted and misunderstood by some. Pettenkofer used the subsoil water only as a convenient and practical measure for the humidity of the soil.

Annexed is a chart showing the monthly rainfall for Murtoa from 1884 to 1895 as supplied to me by the Government Astronomer. The second curve represents the typhoid fever cases treated by me during that period. It clearly shows the typhoid is limited to a few months—our dry season here, January to June; rise in January, acme in March or April, decline towards June. With very few exceptions it is totally absent in the second half of the year, after the winter rains have thoroughly soaked the ground, while its absence in the first half of the summer is due to the soil not being sufficiently dried out yet. It is not the hot season that is the productive one; the heat is only an adjuvant by evaporating the moisture of the ground. Nobody can say that March and April, into which the acme mostly falls, are our hottest months. If the first part of the summer is devoid of rain, or if the spring rains are deficient, then the fever acme comes on sooner, too—in January or February,—but it mostly requires the extreme heat and dryness of February to prepare the ground, to dry it up sufficiently; therefore the acme of the typhoid fever curve mostly falls, not into the dryest month, but a little later. Allowance must also be made for the period of incubation.

The other *conditio sine qua non* is that the subsoil is contaminated with human and animal offal and refuse of the nitrogenous group, of which night-soil and slaughter-yards' offal are the most dangerous. In Europe such rich and deep clay and loam as we have here in the Wimmera is almost immune against typhoid, because clay and loam retain the moisture longer than sandy or stony soil, and therefore in countries with a big rainfall they never become sufficiently dry to allow the typhoid fever germs, even if they be present, to escape with the underground air-current. The typhoid season of Mingip is about a fortnight, and that of Warracknabeal fully a month, earlier than that of Murtoa, because, being more northerly, they have an earlier summer and a little less rainfall.

After this detour, we come back to treatments. It would be waste of time to describe the general effect of the cold bath, as I would simply have to repeat those statements which have been laid down in previous treatises by several authors, who mostly wrote about hospital treatment; but my object is to show that it can also be carried out in private country practice with excellent results.

Coming to details, I must state that—for pecuniary reasons—I nearly always had to do without trained nurses. There is hardly a household, however small it may be, where you do not find a person that you can teach in a few minutes how to use and to read the thermometer, and that—the correct record of the temperature—is the most difficult part of the whole nursing. I have the temperature tested every three hours, or if the fever be very high every two hours—mostly per anum, sometimes per vaginam—and whenever the temperature reaches 103° a cold bath of fifteen minutes' duration is given, as cold as it is to be had without artificially lowering it by ice. If the water is rather warm owing to the outside temperature, the bath is prolonged to twenty or even thirty minutes. For pecuniary reasons I never employed artificial ice, although I highly appreciate its use. I never concede to have the thermometer placed in ore or in axilla, because too many errors creep in by thus using it, and I never experience the least resistance. Besides, it is much more tiring for the patient to keep the mouth or axilla tightly shut for five minutes. At the first bath I nearly always attend personally. The patient is stripped, and steps into the bath himself. I purposely say "steps in himself," because by applying baths at once I do not give the patient time to become too delirious or too weak, and through its continued use his strength is preserved, so that it is very rarely—only in extreme cases—necessary to lift one into the bath. Children, though, generally have to be put and held in, *nolens volens*. The first bath or two I mostly take the chill off. He is sitting up in the bath, and the attendant is kept busy all the time rubbing his chest, front, back, and limbs, with a towel. This has the effect of increasing the flow of blood towards the skin; the consequence is, firstly, the blood is cooled down more rapidly, and, secondly, the person does not feel the cold so much. When the time is over he steps back into the bed, where he is rolled up tight in woollen blankets, without being dried and without any shirt. A mouthful of good brandy before and after the bath is very beneficial, especially to alleviate the shivering after coming out, which is sometimes so severe that the bed is shaking; but that cannot be helped, and is of no significance. In many cases—again *propter pecuniam*—I have to do without the brandy, when some warm drink—tea—will take its place. Sometimes I get a message: "The patient will not bathe any more." When I come there I find the fever symptoms more pronounced than ever. I pull off my coat, roll up my sleeves, fetch the despised bath out of some corner, put it again alongside the bed, and the whole process is gone through—me present. I mostly find that the rubbing has been neglected or insufficiently carried out. The patient is afterwards mostly quite happy; all the headache and nervousness is gone again; the pulse, which was 120 or more, went down to about 80; respiration is of normal frequency; there is no pain; and the patient shortly falls asleep. Henceforth he mostly pays strict attention to keep correct time for the baths, because he feels their benefit, although it seems at first a cruel application. I can speak from personal experience, because I have gone through it myself in 1890. After the bath the attendant or nurse is quite pleased to have a sit-down for a while, because it is not easy work, and for one attendant it would be simply a matter of impossibility to keep on bathing his patient for three, four, or five weeks, as the case may be, day and night, every three, or even every two hours. Yet—again for pecuniary reasons—in very few cases you have two nurses at your disposal to change about. One generally has to see the case through, as the nurse is mostly the mother or husband, or other relative, or some hired person. How is that to be managed? In such cases I give the baths up to about 11 p.m., and then I give one dose of antifebrin, gr. IV. A single dose nearly always suffices, because these antipyretics seem to act more effectively if given at long intervals only, and between the baths. These intervals between the baths give not only the nurse the absolutely necessary night's rest, though a short one, but are also welcome to the patient, and have a good effect. If it is necessary to give many baths—over 100 baths is not uncommon; 140 is about the maximum number of my cases—the feet have no time to get warm in spite of warm applications to them, and this cold feeling in the feet is not only unpleasant, but increases sometimes to real pains. In such cases a night's rest with one dose of antefebrin or antipyrin is of great value. The slight perspiration which mostly follows after the antipyretic, has worn off by the morning, and the bathing can be started again. Supposing the temperature has reached the bath limit and the patient is perspiring a little, I have not the slightest hesitation in rubbing him dry with a towel and putting him into the bath. I have never seen a bad effect from it. Nobody in the world catches cold while he has fever. Only, if the perspiration is severe, it is better to wait an hour or two and then test the temperature again, when it will be seen that it has receded spontaneously; if not, we have the means to make it recede.

It is an old experience that it is very injurious for the patient to be shifted either by rail or other conveyance. I therefore prefer to leave him where he is, if it is any way manageable, as long as I have for him a bed, a person, and a bath.

From a pecuniary point of view the treatment by baths is far less expensive than the medicinal one. If the machinery is once set going like a clockwork, I have no more apprehension and no anxiety about the patient. I only visit him every two or three days, sometimes not so often. I have treated severe cases, at a distance of ten miles and more, to the greatest satisfaction on both sides with only weekly visits, while under other treatment one or even two daily visits are indispensable. The cold bath is the best and safest nervinum and antipyretic.

If your treatment is so good, why do you have any fatal cases at all? Let us analyse them.

The first one, a boy of five years, died after four weeks' high fever from acute nephritis, which came on in the third week and exhausted his strength Hydrops anasarca set in; the urine was thick with albumen. This is the only case complicated with nephritis I experienced.

No. 2, 4, and 8, were cases of that ominous fatal kind where little bluish-black spots appear all over the body; petechial and large extravasations under the skin, which even laymen recognise to be of evil omen, and which are generally combined with hyperpyrexia, though No. 2 had very moderate fever. These cases die generally rapidly and unexpectedly from syncope. Besides that No. 8 case came very late into my hands. She had been treated previously with medicines by a colleague, until the continued delirous state frightened her husband.

No. 3 was a severe case with hyperpyrexia. Baths were ordered every two hours. When I came there one evening another nurse was in attendance, who had not yet been instructed by me. I found the record of the temperature not in harmony with the appearance of the patient, and further inquiries elicited the fact that the thermometer had been applied the wrong way—the mercury outside! She departed in the same night, in the fifth day of treatment. Her husband had succumbed to the same disease a few weeks previously, under medical treatment, under the care of a colleague. Another point against her was that she had a five months' old baby, therefore she was evidently not in her full power of resistance. Her daughter, the third patient out of the same family at the time, became ill shortly afterwards. She received nearly one hundred baths, and is in good health at the present day. The unfortunate occurrence with her mother had not at all shaken the confidence in the baths with her relatives; but rather to the contrary.

No. 6 was a three-year-old boy, with congenital regurgitation and stenosis of the mitral valve. I knew him since he was born; in fact, I never expected him to reach that age. The certificate for burial was ready for him at any time without any additional acute disease. He had quite a purple complexion, never was able to run, and even moderate exercise caused dyspnœa. I suspected patency of the foramen ovale, but could not get a *post mortem* examination. He stood the baths extremely well, as they caused no dyspnœa, and he battled the illness much longer than I anticipated. He died from asthenia, after eight days, exhausted with diarrhœa. He got about thirty baths in the first five days, but then became subfebrile, so that they were not needed any more. If there is ever a test case about the value of cold baths as a heart tonic it was this one. His mother was more astonished than I that he stood them so well.

No. 5 was brought in from the country with severe rheumatic fever. The heart was racing, pulse uncountable, cyanosis. She improved under large doses of sodii salicylate so much that after seven days the pulse was only 88. I expected a quick recovery. Two days after fresh fever symptoms appeared, with delirium, sleeplessness, &c., and I was doubtful about the diagnosis for two days. On the third day of the new illness I could make the diagnosis of typhoid fever, but she died on the fourth day from a complication with hypostatic pneumonia, having received only one bath. Strictly speaking she ought not to be counted, because the severe rheumatic fever that immediately preceded had certainly impaired her heart. She acquired the typhoid in the township—it was a typhoid fever season—and she was located in a house well known to me as a nidus of typhoid fever.

No. 7 came late into my hands. I fear he was neglected at home, as he was not at home for a long time previously, and only took refuge at the parents' house when he was already afflicted with illness. He died on the fourth day of my treatment.

With good conscience I could leave out at least No. 5 and 6, and that would materially alter the statistics; but I do not attribute any importance to these figures. The principal feature is the general improvement in the appearance of the patients under the bath treatment. I do not like excuses, and, therefore, I counted whosoever died under my hands, no matter under what conditions and in what state he was received by me.

Contra-indications against the bath I do not know of. If one is too bad for the bath he is certainly too bad to live, and no medicine on earth would save him. Menses are generally held to be one, but practically they come but seldom into consideration, because as a rule they cease during the illness Most authors bathe even if they do make their appearance. Bronchitis and asthma constitute no contra-indication. A man, 58 years of age, with chronic bronchitis and asthma, had to give up farming and come into the township to live to get easier work. He acquired the illness, was treated with forty-seven baths, which he stood splendidly, was about four weeks in bed, and is to day in better health than for a long time before. Hemorrhage from the intestines is no absolute contra-indication against bathing. The bath treatment seems to be a safeguard against perforation. I have not seen a case of perforation under bath treatment, neither in hospital nor in my own private practice.

Remarkable is the short time within which reconvalescence takes place when so treated. If they are a week without fever you cannot hold them in bed any more; they want to get out by all means, and are able to do so too, I was treating an old patient, while a colleague of mine was treating a boy in the adjoining house; both were laid up about the same time; both were about equally severely affected; and the public watched the two cases with curiosity for comparison, as that treatment of mine was entireiy new here. My old patient, as soon as the fever had left him, was walking about, while the boy was tied to the bed, unable to get up, because he had emaciated to a skeleton. And that is another great point in favour of the bath treatment—they do not waste half as much; it is quite plausible too. By bathing you do not introduce a poison into the body, like you do with any antipyretic. Although very beneficial at great intervals, you cannot help getting the impression that they injure the body when given frequently, and in such large doses as is necessary to reduce the fever symptoms. Another reason why the patients do not waste so much is that they always want more to eat than they can get, although my allowance is on a rather liberal scale.

The bowels, if too free and moved with pain, I stop with a few drops of tinct. opii; if too costive, glycerine-suppositories do splendid service.

The dry leather-tongue, delirium, unconsciousness, sleeplessness, I know only from the text books. I never experience them if the treatment is in full swing. If these few words only induce one colleague to adopt that treatment with the utmost confidence of success, I am perfectly satisfied he will find that not only his patients, but also his pocket, will benefit materially. But it requires a good deal of courage to adopt a bold treatment that you have not seen carried out before, and therefore I think it is a duty of the hospital physicians to give it an earnest trial. I am sure the hospital committees would be only too thankful to them on account of the lessened expenses, both by the way of shortening the stay of the patients and by the way of saving in medicines.

A discussion followed the reading of this paper, in which Dr. McDonald, Sydney; Dr. Dyring, Coburg; Dr. Hayward, Adelaide; Dr. Roberts and Dr. Colquhoun, of Dunedin, took part.

TREATMENT OF SPASMODIC LARYNGITIS OR CROUP.

By Carl P. W. Dyring, M.A., M.B., B.S. Melb.

In this paper it is not intended to enter into the question as to the identity or not of laryngismus stridulus with croup or spasmodic laryngitis. Rather it is intended to be quite practical, and to be confined to the treatment of this troublesome complaint. Further, it is admitted from the outset that the line of treatment is absolutely useless in diphtheritic croup. The cases that respond, answer the very vivid description given of spasmodic laryngitis by Starr in his "Diseases of Children."

The main clinical features differentiating spasmodic laryngitis, vulge croup, and laryngismus stridulus appear to be that in the latter there is no preceding coryza, and absolutely no temperature. In my personal experience I can recall no case of pure laryngismus stridulus, so that the treatment cannot be vouched for as far as that complaint is concerned, although it would probably be beneficial in it, but I have adopted the same line of treatment in some hundreds of cases of the "croup" of the laity, and always with such beneficial and, at times, surprising results that I crave your indulgence in bringing it under your notice. In these cases the usual history is as follows:—The child has been playing about during the daytime apparently well except for a slight catarrh. Towards evening he becomes hot and feverish, with the ordinary symptoms accompanying a rise of temperature. He has probably an overladen stomach to add to his other troubles. A few hours after going to sleep the child wakes with an attack of what is apparently suffocation.

The child begins to cough—the hard, brassy cough of croup, respiration being prolonged and stridulous; expression becomes anxious; the muscles of extraordinary respiration are in activity; pulse rate rises; face becomes congested, sometimes livid; the paroxysm gradually subsides, even without treatment, probably from the effect of the imperfect oxygenation of the blood. In the morning the child will be apparently well again except for an occasional cough, and the drama is re-enacted the succeeding night or perhaps nights. Without doubt the paroxysms are partly induced mechanically by a tumefaction of the vocal chords, but mainly by reflex action of the laryngeal muscles, chiefly through the pneumogastric.

The ordinary routine treatment is a hot mustard bath, ipecacuanha wine until emesis is produced, and a dose of oil. In nearly all cases this line of procedure succeeds.

The objects to be attained are a relief of the reflex spasm, a diminution of blood pressure, and a reduction of temperature; for, in spite of authorities, I confess I have never seen a case of this disease without a rise of temperature.

As the reflex spasm is often due to irritation of the pneumogastric and sympathetic nerves, and as its causation is most frequently due to food improper as to either quantity or quality, the first process is to clear the intestinal tract by enema and a powder of calomel. For the relief of reflex nerve action, for diaphoresis and for reduction of temperature, the combination used is phenazon and sodii bromid., the effect of which is much enhanced if the patient be placed in a warm bath before taking the mixture. The effect of this combination is frequently theatrical in effect. I have now used it in about 200 cases, and so far with only two failures: one of which was due to the remedy being mal-administered; the other I can only account for on the assumption that it was a case of diptheritic croup with membrane so low down as to be out of sight. The child died from asphyxiation, with heart failure. Otherwise I treat the ordinary croup of the laity, and feel absolutely certain of the result.

My plan is, if the paroxysm be present, to give a warm bath, an enema, and a calomel powder. Half-an-hour after give a mixture containing about 1 grain phenazon and 2 grains sodii bromid. for every year of the child's age. Thus, for a child of two years, I would give: Phenazon, 32 grains; sodii bromid., 64 grains; syr. tolut. ½ an ounce; aqua ad. 2 ounces. 1 drachm at once; 1 drachm for 3 doses, if necessary. I have seldom had to give more than 12 grains of phenazon altogether, but would not hesitate to do so if required. Generally, after the first dose the paroxysm begins to subside, and seldom have more than three doses to be given.

The parent is instructed to anticipate the next attack by giving the child the medicine at 5 p.m. and 7 p.m., to be followed by another dose at 9 p.m. and 12 o'clock, midnight, if necessary. The latter two doses are seldom found necessary. Throughout the day no medicine is administered, but the child's diet is carefully attended to. After the first dose the patient as a rule becomes more composed, the skin begins to act, and free diaphoresis follows, accompanied by relief of the laryngeal spasm, and an easy, natural sleep.

Such is the treatment I have persistently used for the last three years in spasmodic laryngitis with the most satisfactory results. I claim for it that it is scientific in basis, that it is easier to administer for the nurse or attendant, and that it is infinitely more pleasant for the little sufferer than the ordinary routine treatment.

In the discussion which followed the reading of this paper Dr. T. K. Hamilton, of Adelaide, drew attention to the fact that, in his experience, many cases of laryngeal spasm were due to the presence of adenoids in the naso-pharynx, and the removal of these growths has in three cases prevented a recurrence of the attacks and removed the tendency. Laryngismus stridulus, and the allied, though somewhat dissimilar affection, infantile respiratory spasm of children, are, it is now believed, due to cortical irritation, which irritation, it is true, may be induced by various reflex causes.

Dr. Lindo Ferguson, Dunedin, thought that in children under the age of 14 these attacks were generally due to cold, and that the naso-pharynx was seldom affected.

Dr. Kenny, Melbourne, was inclined to think that nasal and part nasal troubles were sometimes the cause of laryngismus stridulus.

Dr. Mackenzie, Wellington; Dr. Willis, Dalesford; and Dr. Hayward, of Adelaide, also took part in the discussion.

FIFTY CASES TREATED WITH DIPHTHERIA ANTI-TOXIN.

By A. J. Turner, M.D. Lond., M.R.C.S. Eng.,
Physician for Out Patients, Children's Hospital, Brisbane; and

L. N. Ashworth, B.A., M.B., B.S. Melb.,
Resident Surgeon.

Since near the commencement of 1895, all cases in the diphtheria ward of the Brisbane Children's Hospital have been treated with injections of anti-toxin serum. During the same period bacteriological examinations have been made of the membranous exudations or pharyngeal mucus. We shall endeavour to ascertain in what way the course of the disease is influenced by this new method of treatment, so far as our series of observations throw any light upon the matter.

Our observations refer to fifty-two cases. In forty cases the diagnosis of diphtheria was verified by the isolation of the bacillus diphtheriæ in artificial cultures.* In the remaining twelve cases the results of the bacteriological examination were negative. These unverified cases deserve brief consideration. In three cases the disease would, from clinical examination, have been diagnosed as follicular tonsillitis, and in two cases as a sloughy or necrotic inflammation of the tonsils. In these cases the examination merely confirmed the conclusion that would have been drawn from careful ocular inspection of the fauces. Though at the commencement of the attack the cases had a more or less suspicious appearance, their true nature became apparent within a few days. There were also four cases of membranous tonsillitis, which presented the clinical appearance of diphtheria in which no characteristic bacilli were found. In one of these cases, owing to an accident, no proper examination was made. In the remainder the examinations were not repeated sufficiently to make the negative conclusion as certain as it might have been. But that there exist cases which clinically are indistinguishable from true diphtheria of benign course, but in which the bacilli are absent, has been established by many different observers. There remain three cases of croup in which intubation was performed. In these no undoubted membrane was to be seen on the fauces and pharynx. In one case the swabbing to be examined was accidentally left nine days before being inoculated on to the culture dish, and the negative result of the examination therefore carries little weight. In the other two cases the examination was not sufficient to warrant a negative conclusion. The examination of a single swabbing is more likely to be inconclusive, if negative, than of a distinct piece of membrane. On the whole we think it probable that all three cases—or at least two of them—were really diphtheria.

---

* The cultures were made on glycerine-agar, and examined usually after about twenty-four hours' incubation. If the colonies of bacilli were numerous they might be distinguishable within twelve hours, but with difficulty. On serum the bacilli develope more rapidly, but the glycerine-agar is much easier to prepare. Instead of making the cultures in tubes they were made on films, prepared by pouring sterilised agar into sterilised Petri dishes. The individual colonies can then be examined under an inch objective, and any particular colony selected for making a stained preparation. This method greatly facilitates the diagnosis. The material is best examined fresh. In the cases here recorded some interval elapsed, occasionally several days, before examination. The membrane or swabbing was preserved dry in a sterilised tube. I have found diphtheria bacilli in dry membrane, which has been preserved, exposed to diffused daylight for three or four weeks. On swabbings the bacilli probably do not survive so long. On account of the occasional delay in the examination, the negative results are not of so much value as they might otherwise have been.

In the earlier cases the examinations were made by Dr. Love and Mr. Pound.—[A. J. T.]

All the unverified cases recovered. As they were all treated in the diphtheria ward, an injection of serum was administered in every doubtful case as a precautionary measure. From what we know of the properties of all bacterial anti-toxins, it is certain that their immunising power is far greater than their curative power. And as the injections have produced no ill results we consider that in hospital practice it is far safer to inject a doubtful case with serum and place it at once in a diphtheria ward than to place it in any part of the hospital which is imperfectly isolated from the other patients. Should the case turn out to be really diphtheritic it will have received the benefit of an early injection of serum. Should it turn out to be non-diphtheritic, it will be sufficiently protected against possible infection. The immunity produced by the injection is believed to last several weeks, and there will be no necessity to retain a non-diphtheritic case in the diphtheria ward for more than a fraction of that time.

The following table shows the diphtheria admissions and mortality during the past six years :—

	ADMISSIONS.	DEATHS.	MORTALITY. Per cent.
July, 1889, to June, 1891 (2 years)	73	34	46·6
July, 1891, to June, 1893 (2 years)	114	47	41·2
July, 1893, to January, 1895 (18 months) ...	116	46	39·7
Total number of cases treated without anti-toxin	303	127	41·9
Cases treated with anti-toxin (January, 1895, to November, 1895)	47	10	21·3

This, however, includes all cases which would have been diagnosed as diphtheria in former years on clinical appearances only. Of the forty cases in which the diagnosis was verified by bacteriological examination ten died—a mortality of 25 per cent.

As cases of diphtheria vary very much in severity, it is instructive to compare in the same manner the mortality among those which require operation, intubation or tracheotomy, all of which were necessarily very serious cases—

	OPERATIONS.	DEATHS.	MORTALITY. Per cent.
July, 1889, to June, 1891 (2 years)	42	28	66·7
July, 1891, to June, 1893 (2 years)	60	38	63·3
July, 1893, to January, 1895 (18 months) ...	64	38	59·4
Total number of cases treated without anti-toxin	166	104	63·0
Cases treated with anti-toxin (January to November, 1895)	22	9	40·9

This last table, however, includes three successful intubation cases in which the diagnosis was not verified bacteriologically, although for reasons already given we are inclined to believe that they were really examples of diphtheria. Two cases, which were operated on before admission into the hospital and subsequently recovered, are not included.

It is interesting to observe how closely these results correspond to the much larger statistics recently given by observers in Europe. Taken by themselves the number of anti-toxin cases is too small to be free from statistical fallacies. It is only fair to point out that the six months preceding the introduction of the anti-toxin treatment showed an unusually low mortality. Of twenty-nine cases, only seven died, and of twelve operation cases, six died. In the course of time the fallacy due to variations among small numbers of cases admitted into this hospital will be eliminated, as it has been in the larger statistics to which I have referred.

The remarks that follow will be restricted to the forty verified cases. Classified according to age we have—

	CASES.	DEATHS.
Under two years	7	4
From two to five years	27	6
From five to eight years	6	0
	40	10

Another important method of classifying the cases is according to the duration of the disease on admission. The chief value of anti-toxin is undoubtedly in the treatment of cases at or near the commencement of the disease. Unfortunately we have found it very difficult to determine the date of commencement in our hospital cases. Frequently there has been evidence of careless neglect of observation on the part of the parents. In other cases the child has been said to have been suffering from a "cold" for about a week, and it has been impossible to determine whether this was a fore-runner of the diphtheria, or marked its actual onset. Making careful allowance for these sources of fallacy we have compiled the following table:—

	CASES.	DEATHS.
Treated with serum on first day	0	0
,, ,, second day ...	3	0
,, ,, third day	8	1
,, ,, fourth day ...	6	0
Total during first four days ...	17	1
Treated with serum on fifth day, or later ...	15	6
Cases of unknown duration	8	3
	40	10

Though the numbers are small the results are significant. We do not think that the serum treatment will ever attain its full measure of success in hospital practice, where cases are so frequently brought for treatment in a late and advanced condition of disease. Two of our worst cases were actually moribund on admission, and several others were in not much better condition.

We will now proceed to consider the cases more in detail under separate headings:—

Membrane.—The visible membrane very frequently spread somewhat during the twenty-four hours after the injection, but ceased to spread after twenty-four hours had elapsed. To this there were only two exceptions in which some increase in the area of membrane on the tonsils appeared at a later date. In one case patches of membranous stomatitis appeared, but unfortunately no examination was made to determine whether they were really diphtheritic. In several cases a follicular condition of the tonsils developed after they had become clean. Thickening of the membrane was observed frequently after the injection. Probably this is to be regarded as part of the natural method of healing. The exact date on which the membrane disappeared varied very much; exceptionally a few remnants remained visible even two weeks, or longer.

Laryngeal Cases.—In no cases did laryngeal symptoms appear after the commencement of treatment, and in some cases in which the only laryngeal symptom was hoarseness, nothing further developed. Three other cases had distinct croupy stridor, but recovered without operative interference.

Faucial and Pharyngeal Cases.—All these cases, when uncomplicated by nasal or laryngeal affection, recovered.

Nasal Cases.—These fall into two groups. The first includes two purely nasal cases, which ran a very chronic course and eventually recovered. Although there was abundant membrane, the constitutional symptoms were never very severe.

The second group includes those in which membrane spreads into the nose from below—cases which are well known to be the most severe and fatal type of diphtheria. Of these there were five, three being fatal. Of the fatal cases one was complicated by sepsis and anuria; the other two were tracheotomy cases. The two cases that recovered had also laryngeal obstruction, necessitating intubation; one of them was the most severe of all the cases that ended favourably.

Causes of Death.—The common causes of death in diphtheria are asphyxia, toxæmia, and pneumonia. These are usually more or less inextricably blended together. Asphyxia was usually absent in our cases, or when present was so overshadowed by toxæmia as not to be the chief cause of death. In one case only, after intubation followed by tracheotomy, death ensued with asphyxia from bronchial membrane, with concomitant toxæmia. Pneumonia due to secondary infection was probably present in most, if not all, of the fatal cases. During life its presence was indicated by high temperature, with rapid and shallow breathing. Physical examination was rendered difficult by the presence of conducted laryngeal and tracheal sounds, but in eight of the fatal cases evidence of pulmonary complications was elicited. Sometimes these consisted merely of moist bronchial râles over a limited portion or portions of the lungs. In other cases the moist sounds were finer, and accompanied by harsh or tubular breathing, and in one case there was some dulness on percussion. Former experience has often shown the existence of broncho-pneumonia in cases of this kind examined after death; but, unfortunately, in this series we have only one *post mortem* to record. This is, however, a very instructive one.

James D., aged 3½ years, was admitted cyanotic in an advanced stage of disease. Intubation relieved the asphyxia, and the tube was dispensed with on the seventh day. Nevertheless he never really rallied, the pulse and respirations continued very rapid, though the temperature was low, and râles could be heard over many parts of the chest. *Post mortem* were found considerable patches of bronchopneumonia. From a recent patch a pure culture of the pneumococcus of Fraenckel was obtained. An older patch yielded the same organisms, together with many colonies of diphtheria bacilli. These results were confirmed by staining coverglass preparations and sections of the lung. All membrane had disappeared from the air passages. The presence of a secondary infection was demonstrated in this case.

Effects on Temperature.—We have carefully gone over the temperature charts to endeavour to ascertain whether the injections of serum had any effect in raising or lowering the temperature. The temperature in diphtheria is very irregular, and it would be easy to quote cases in which the temperature either rose or fell after injection. Without entering into any lengthy analysis we will merely state our conclusion that the injections have no constant immediate effect on the temperature, and that the variations observed were independent of any direct influence of the serum.

Kind of Serum.—Four kinds of serum were used—(1) that prepared by Ruffer at the British Institute of Preventive Medicine; (2) the same in a dried form; (3) Behring's serum; (4) Aronson's serum.

Aronson's serum was used in three cases. In two cases the dose was so small (12 to 20 minums) that it can hardly have influenced their progress. In the third case only 5cc. were injected, and Ruffer's serum had been used previously, as it had been subsequently in the first two cases.

The dried serum was used in five cases, of which four recovered. Altogether eighteen cases were treated with Ruffer's serum, dried or liquid, with four deaths. With Behring's serum twenty-one cases were treated with five deaths. Both Behring's and Ruffer's serum were used in one fatal case. It would be fallacious to draw any conclusion as to the relative efficacy of the serums from these figures.

Dosage.—In some of the earlier cases the initial dose of serum used was inadequate. Latterly large doses were used. For a mild attack one bottle of Behring's No. 1, 600 units, were injected, and not repeated. In a severe case we would not inject less than 1,200 units at the commencement, and repeat the injection within twenty-four hours if the symptoms of toxæmia continued severe. Of Ruffer's serum a larger dose, 23cc., was used in most cases, but we do not know its exact anti-toxin strength.*

In the worst cases, including most of those that died, and some that recovered, repeated injections were made at twelve or twenty-four hourly intervals. One fatal case received seven bottles of Behring's No. 1, 4,200 units, in the course of twenty-six hours. The next largest quantity, 3,600 units, was injected in three doses in one of those that recovered. Another successful case received altogether 80cc. of a solution of the dried serum of Ruffer, each 50cc. contained 4½ grammes. We were not able to observe any injurious effects from these large doses of serum, but believe that without them the two latter cases would have died.

---

* The estimation of anti-toxin strength is fully discussed in the *Intercolonial Quarterly Journal of Medicine and Surgery*, May, 1895.

Toxic effects of serum.—The only toxic effects that we observed were the occasional appearance of a patchy erythematous rash, somewhat resembling urticaria, but not in distinct wheals, accompanied sometimes by subcutaneous œdema, and in one case pains in the limbs were complained of.

The site of the injection was usually tender for a few days, no doubt as a result of the mechanical irritation from the distention produced by the injection. Sometimes a little localised redness developed, sometimes there was a little evanescent swelling on the day following the injection. Beyond this there was never any sign of inflammation, and suppuration never occurred.

Two cases had a rash on admission. In one this was merely a slight papular eruption which might have been caused by some local application. In the other it was a punctiform red rash, perhaps of septic origin, as the fetor from the mouth and nose was intolerably offensive. This case ended fatally. In a third case a copious scarlatiniform rash appeared after admission before the serum was injected. It disappeared on the following day, and was not followed by desquamation. In one case a papilliform rash was observed on the seventh day after injection.

The erythematous rash which we attribute to the serum was observed in five cases. The first of these was a case not included in the statistics, admitted some weeks after tracheotomy. This case had been injected three times with Behring's serum without any signs of irritation following; but twelve hours after the fourth injection into the subcutaneous tissue of the abdomen there appeared a considerable œdema of the neck, lips, and face, followed by the rash on the next day. The œdema rapidly subsided, and was not accompanied by more than trivial constitutional disturbance. In the other four cases the rash followed the injection of Ruffer's serum, and it is noteworthy that it only appeared after an interval of nine to eleven days. In one of these cases a marked rash appeared on the fourteenth day, accompanied by pains in the limbs, and fever, the temperature rising nearly to 104. After two days all these symptoms disappeared. In an infant a well-marked rash appeared on the eleventh day, and was accompanied by an acute œdema of the hands and feet; but there were no symptoms of fever or malaise. We have never seen eruptions or œdema of this kind in cases not treated with serum.

One non-diphtheric case complained of pain and tenderness in one thigh on the fourteenth day after injection. No symptoms of carboluria were observed in any case. [Behring's serum contains 0·5 per cent. of carbolic acid.]

Albuminuria.—The urine was examined in most of the cases; but in six cases examination was omitted on account of the child dying very soon after admission, or because none could be saved. Of the remaining thirty-four, albumen was discovered in twenty-five, but in nine only a trace was present. In one case the proportion of albumen rose to $\frac{7}{8}$, the quantity falling to 6 ounces in the twenty-four hours; in another to $1\frac{1}{3}$. Both these cases recovered. In one case death was preceded by anuria, in another by very scanty urine; but in both the other symptoms of the disease were of the severest. In one case, aged five years, the quantity of urine fell to 6 to 7 ounces for three days, but contained no albumen. This case did well.

We regret that we cannot compare these cases with a series not treated with serum. A careful examination of our cases inclines us to believe that the albuminuria was dependent on the disease; we cannot find any evidence connecting it with the serum injections.

Post-diphtheritic Conditions.—Paralytic symptoms were rarely observed. One case had a syncopal attack on the seventh day. He became suddenly very pale, with scarcely perceptible pulse and cold extremities; but rallied, and the attack was not repeated. A second case had severe palate paralysis. A third case was aphonic for some time after intubation; a laryngoscopic examination, though incomplete, apparently revealed incomplete adduction of one vocal cord. A fourth case left the hospital aphonic, but the cause was not ascertained. Finally, one case was admitted into the hospital for removal of the tracheotomy tube, which could not be accomplished before it had been worn four months, on account of paresis of the adductors of the cords combined with adductor spasm. One infant suffered from tympanitic distension of the abdomen, with apparently enlarged liver, one month after admission.

We are indebted to our colleagues for permission to make use of their cases in this analysis.

Dr. Springthorpe, Melbourne, spoke highly of the benefit obtained by the use of anti-toxin, but it should be used early, as then complications were little to be feared.

Dr. Chapple, Wellington, had found, he believed, great benefit from anti-toxin, especially in severe cases requiring tracheotomy.

Dr. Love, Brisbane, said that there was still need of more information on the subject. Now we commence treatment more hopefully with the help of the anti-toxin. In Brisbane tracheotomy was almost a thing of the past. Intubation was practised almost exclusively.

Dr. Hayward, Adelaide, said in Adelaide the anti-toxin is used in all suspected cases of diphtheria. Further statistics were wanted before its usefulness could be said to be definitely settled. He mentioned one case in which he had given chloroform early, and treated a suspected patch antiseptically, with complete success.

Mr. Cameron, Dunedin, made some remarks on diphtheria in animals. He had not used anti-toxin.

SOME GENERAL MEDICAL ASPECTS OF NASAL OBSTRUCTION.

By J. Lockhart Gibson, M.D. Edin., M.R.C.S.

Hon. Surgeon for Eye, Ear, Throat, and Nose, Brisbane Hospital for Sick Children.

The aim of modern medicine is to find and treat causes, and to treat symptoms only if a cause cannot be found. If a cause can be found and removed, symptoms, unless urgent or long established, may generally be left to themselves. This paper is intended to add something to the accumulating evidence regarding some causes which seem to be at work in producing symptoms of a general medical kind.

Di Rossi, at the eleventh International Medical Congress, defined a specialist as "one who has a special knowledge in his own department, and who is a complete clinician in the whole field of medicine." It is well to have a definition which demands so much. The higher our aim, the more will we achieve. Certain it is that a specialist who is not a complete clinician in the whole field of medicine can take only a narrow view of his patients, and his treatment of them must be accordingly circumscribed, but as true, on the other hand, that the general physician should possess some knowledge of such so-called special departments, as otherwise he is apt to overlook the necessity for special examination and treatment. It is quite impossible for him, however, to have an accurate knowledge regarding fine irregularities—for instance, of refraction or of the lining of the nose. Such can only be acquired and retained by one constantly kept in touch with the structures involved, by daily frequent examination of patients, normal and abnormal, and who, placing his own observations first as most important to himself and his patients, is prepared to take advantage of the work of others as reported in current medical literature.

In writing this paper for a general medical section I run considerable risk of the accusation that the views expressed are the result of riding a hobby, and are consequently the narrow and biassed views which it should, as above stated, be our aim to avoid.

Perhaps it is impossible for any man to entirely escape from taking a rosy view of the result and far-reaching effect of treatment in his own department. As my work has, however, only become entirely restricted after a fair probation of general work, and as I still take an intense interest in the whole field of medicine and surgery, I trust that I may not be too severely censured for pointing out matters which seem to me deserving of the most serious and favourable consideration of both general and special physicians. When looking over my note-books for this paper I carefully excluded the many cases evidently suitable only for treatment by a specialist, and tried to take my data only from those who would be likely to consult and be treated by a general physician in the first instance. My first list included 260, but after further severe weeding of those whose special symptoms were more prominent, I find more than 100 who might be truly so described. Many of these were sent to me by brother practitioners, and others came direct.

There are, of course, many fallacies incident to all inquiries of this kind; and I have endeavoured to eliminate from the favourable side cases which may have escaped sufficiently extended observation, and cases which, after apparently improving in the first instance, may have relapsed and sought, unknown to me, other advice. As in all treatment there is a nervous element of "faith healing" to reckon with, and undoubtedly it is a powerful factor in some cases, especially those of neurotic diathesis. The patient, possessed of a profound belief in his medical attendant and in the efficacy of his treatment, may often bring his nervous system so powerfully into play as to help his cure far more than the proceedings of the physician or surgeon—general or special.

I am not yet in a position to furnish definite statistics as to what proportion of patients suffering, say, from asthma recover or improve under intra-nasal treatment, and what proportion fail to obtain benefit. The paper is intended more to point out conditions in which a possible nasal factor may merit attention, and to mention from my own experience the number of cases which seem to me to have derived benefit. More value may, in my opinion, be attached to the results of so indefinite an inquiry in the chronic conditions I am about to mention than in the case of acute conditions, as in the case of patients suffering from long-standing or frequently-recurring affections, a definite improvement following some particular line of treatment can, as a rule, be attributed to that treatment.

In treating intra-nasal and nasopharyngeal conditions we have to consider not only gross nasal obstructions, but slighter ones, and in addition, hypersensitive areas in the nasal mucosa, which may operate, not only as reflex sources of irritation, but as local causes of temporary or persisting turgescence of the erectile structures in the nose.

On looking through my records of cases prior to 1890, I find that although markedly deficient nasal respiration was treated, and, if possible, corrected, slighter obstructions, either anteriorly or nasopharyngeal, were left as insufficient to account for the symptoms complained of. Each year I have been more inclined to attack small nasal obstructions and possible sources of reflex irritation, and smaller adenoid growths; and the gratifying results obtained have led me to regret that in many of my earlier cases operative measures (as a rule comparatively simple) had not been resorted to. I have many times been surprised at obtaining most gratifying results in apparently similar cases.

The gradual restriction of my work from general to eye, ear, and throat work, has given me opportunities of seeing cases which might not otherwise have suggested to medical men the need for special treatment. It has been very specially borne in upon me that the finding of obstructions or irregularities in the nose or nasopharynx does not of itself justify interference, because in many cases one finds these in a marked condition without being able to detect any symptoms. This is, however, no reason for refraining from interference when symptoms occur which could be ascribed to them, any more than the fact that many men and women go through cultured lives with two and three diopters of hypermetropia and suffer from no eye trouble, headaches, nor inconvenience, until presbyopia approaches, would cause us to hesitate to prescribe a diopter or even less for young people who cannot with comfort make the extra accommodative effort. People differ within wide limits as regards the amount of accommodative effort they can comfortably make, and as regards the amount of nasal obstruction or nasal irritation they can bear without discomfort or apparent injury, just as we find patients differing within wide limits regarding the doses of potent drugs required to produce physiological effects. The cases of nasal obstruction, however, who go through life quite scathless are rare. It frequently happens that after many years of health of chest, ears, and throat, an attack of influenza or of some specific fever, which with natural respiratory passages would have passed off probably without leaving permanent damage, leaves its mark upon the ears, larynx, or lungs, and one is driven to the belief that had the nose and nasopharynx been normal these sequelæ would have in many cases been avoided, and even to wonder whether the disease itself would in that case have taken root. Again, I have yet to see a person above middle life with obstructed nasal respiration and possessed of a healthy nasopharynx and middle ears—*i.e.*, healthy to examination, though not necessarily the cause of noticeable inconvenience to the patient. The effect of anterior nasal obstruction is thickening and swelling and consequent want of health of the mucous membrane of the posterior nasal passages and nasopharynx, and a resulting diminution of its disinfecting properties and protective powers against disease. Obstruction from the nasopharynx means that its protective mucous membrane is comparatively powerless. Any kind of nasal obstruction means that much of the breathing has to be done through the mouth, and that the warming, moistening, filtering, and disinfecting of the air which is carried on in the nose has not occurred, and that the inspired air is, therefore, less grateful to the lungs.

Small and large nasal obstructions or irregularities are credited with giving rise to reflex neuroses of a curious and complicated character. It is questionable, however, whether these are all truly nasal reflexes, or due to respiratory blocking and to consequent variations in the tension of the air in the middle ears, or of the perilymph and endolymph in the vestibules and semicircular canals.

I have ten cases of asthma cured, or in a few instances so relieved as to be practically cured, by treating nasal obstructions of varying degree and position. This number does not include cases of hay-asthma, one of which was cured after persistence for seventeen years. Neither does it include more than double that number of cases of chronic or frequently recurrent bronchitis. Cases of asthma, or of chronic or recurrent bronchitis, in children are so often associated with nasal blocking that attention should be in them particularly directed to the nasopharynx and nose, and those who have abnormalities in these cavities thoroughly corrected will obtain gratifying results in otherwise unsatisfactory cases. I have notes of nine children whom I know to have been cured, and of several others who, although relieved, require further observation. With regard to asthma it is not too much to say that a causal condition has not been thoroughly sought for until the nose and nasopharynx have been completely overhauled. This also applies to chronic and recurrent bronchitis, and very especially so in the case of children.

I find thirty-five cases in whom chest and throat trouble of a more general medical kind were associated with obstructed nasal respiration, some of whom had been wrongly suspected of being phthisical. Improvement after correction of the nasal trouble was in most very marked. Cases in which the symptoms calling for attention were those of deficient health, or of aprosexia, or of bad sleep, and in whom the condition could be ascribed to nasal obstruction numbered over twenty, and in all of these improvement of a marked degree followed the removal of the obstruction. Other similar cases declined interference, and there were of course some cases in whom the results were rather negative than positive. As mentioned before in a good many observed cases the presence of some more or less marked nasal obstruction seemed to determine acute or subacute middle ear disturbance during, or after influenzie or similar attacks. This opinion is based on the observation that middle ear trouble seems to occur in conjunction with such attacks in only a few cases where the nose and nasopharynx have been previously healthy. Many such cases admit, after removal of the obstruction, that they did not know before what nasal breathing was.

Amongst possible reflex neuroses I have observed epileptiform attacks and incontinence of urine; and one marked case of vertigo in a lady, which slight or absent during the day became invariably worse on lying down. The electrocauterisation from behind of a soft swelling on each side of the posterior margin of the nasal septum got rid of the vertigo at once and permanently. Cases of stammering *may* come into the class of possible neuroses, although the question as to whether they are not due to disturbed nasal breathing is open to discussion. I do not recall a single case of stammering in whom there has not been some nasal trouble back or front, or, if the case be an adult, some middle ear disease—the legacy probably of previous nasopharyngeal obstruction. But I must admit that I do not remember definite amelioration to have followed any operative measures, and I have not had an opportunity of correcting nasal irregularities in a stammering child. The effect of nasal obstruction on functional and general conditions seemed to me to be particularly pointed out by two cases of young girls—one 14 to 15 years and the other 17 to 18 years of age. They were stunted in growth, unhealthy looking, without being anæmic, and neither had commenced to menstruate. Both possessed large tonsils and many adenoids. Menstruation commenced in both a few weeks after cutting of tonsils and removal of adenoids, and both developed into fine healthy-looking young women. I have a third under treatment at present, and expect a similar result.* The younger, who had been very deaf since a small child, regained her hearing. The hearing of the other had not been diminished to any inconvenient degree.

One case of unilateral exophthalmos in a young woman, accompanied by epileptiform attacks and severe headaches and sneezing, seemed to result from a small polypoidal excrescence on the posterior extremity of the superior turbinated bone. Removal of this was followed by stoppage of the epileptiform attacks and of the headaches, also by lessening of the sneezing and some retrocession of the exophthalmos. A possible fallacy, however, must be noted, as some of the improvement was doubtless due to my correction of three diopters of hypermetropia. Were I to include the now generally recognised and various smyptoms of adenoid growths in children my paper would be too long, and I have purposely refrained. Not the least important symptom is mental dulness and lassitude. Most of the cases which form a text for this paper are ones of anterior nasal obstruction by septal irregularities, large turbinateds or thickened posterior margin of the nasal septum, or of adenoid growths in adults. In children nasal obstruction is so generally due to adenoids and adenoids only that we are apt sometimes to fall into the error of neglecting in them the causes which are most frequently seen in adults.

---

* This expected result was obtained.

I have not described the various intranasal conditions, as I have not wished to be too uninteresting, and as I am of opinion that careful search by one in the constant habit of searching these cavities is the only road to thorough treatment. A point, however, which can hardly have too much emphasis laid upon it is that intranasal surgery is scientific only when its aim is to restore the parts to a normal state. The wholesale removal, for instance, of turbinated bodies can be in very rare instances necessary. Patience and perseverance, with minor operative measures to septum and turbinateds, are as a rule sufficient, unless the accessory cavities are involved.

A CASE OF PHARYNGO-MYCOSIS LEPTOTHRICIA.

By Cecil Purser, B.A., M.B., Ch.M., Sydney; and
Frank Tidswell, M.B., Ch.M., Sydney.

The patient, C.P., male, aged 35 years, first consulted one of us (P) on 4th April, 1894. He had spent most of his time in the country on stations, came to Sydney seven or eight years previously, and had since been engaged in bonded stores. He is a man of temperate habits, and has a good family history, except in so far as the recent death of his father from Bright's disease can be considered a defect in this particular. When first seen he complained of having felt out of health for the past two years; of late he had become subject to asthmatical attacks of varying frequency and severity. He presented the appearance of an asthmatic, being thin, round shouldered, of dusky complexion, with rather sunken eye-balls, and prominent cranial veins. Examination showed that both lungs were slightly emphysematous, but there were no other physical signs. The urine was examined for albumen with negative results.

Under treatment he exhibited the usual vicissitudes of an asthmatical subject, but on the whole showed gradual improvement during the succeeding two months. He then complained of slight soreness in the throat and huskiness. On examination, the left tonsil and the mucous membrane immediately below it showed a number of small white projections. The tonsils were swollen and congested, but there was no decided inflammation. On being questioned, the patient stated that he had noticed some white spots on his throat some weeks previously, but as they caused no pain nor discomfort he had taken no notice of them. The only alteration in the treatment it was considered advisable to make at the time was the use of a sulphurous acid gargle. At the end of the next two months the asthma was completely relieved. The growths in the tonsil had increased in number and spread downwards. The throat was, therefore, curetted with a Volkmann's spoon. The patient refused an anesthetic, but with cocaine we were able to remove all the visible growths, which were reserved for microscopical examination (v.i.) After their removal the tonsil presented a honeycombed appearance, due to the pits which the growths had formed in its tissue. There was practically no bleeding during the operation. The tonsil and adjacent mucous membrane were swabbed with Hydrarg. perchlor. lotion (1 in 500), and a gargle of the same ordered. In addition, a paint containing iodine and boracic acid was prescribed. When seen again a month later a few fresh growths had appeared, which were removed with the curette as before.

The growths continued to appear in small numbers for the next month or two, but as they caused no inconvenience nothing further was done to them. A year later the patient informed one of us (T.) that he was quite well in general health, and the throat had been free from white spots for some time.

Microscopical Examination of the Growths.—The growths removed from the tonsil varied in size—from a pin's head to a small grain of wheat,—and were of a dirty white colour. They were spindled-shaped in general form, and when in position one end of the spindle was embedded in the tonsil, the other projected into the buccal cavity. Their consistence varied; most of them were firm and hard, a few quite soft. Teased out in ·75 per cent. salt solution they readily broke up into hard flakes and soft friable material. The hard flakes examined under the microscope presented an appearance comparable to that of the stratum corneum of the epidermis. Boiled with caustic potash they became soft and semitranslucent. We are hence inclined to think they were composed of matted, horny (?), epithelial cells. The soft material was found to consist of bacteria, epithelial squames, and granular *débris*. The bacteria were extremely numerous and of various forms. By the application of the appropriate tests we were able to recognise the following species :—

1. Bacillus (leptothrix) buccalis maximus.
2. Leptothrix innominata (Miller).
3. Jodococcus (Miller).
4. Spirochetæ dentium.

Some curved and comma forms were present, probably representing the ordinary mouth spirilla, but no true spirals were found. Large and small bacilli and cocci (single and in groups) were also seen, but presented no distinctive characters. Cultivation experiments were made by sowing the material on gelatine-agar, blood serum, broth, potato, and bread paste; the cultures were tried at room and incubation temperatures. The resulting growths consisted of staphylococcus pyogenes albus and another coccus which we failed to identify. Hence the majority of microorganisms seen in the smear preparations failed to grow on the ordinary nutrient media. In all probability they belonged to the uncultivable varieties of mouth bacteria described by Miller.*

In our specimens, then, we found only those form of bacteria which commonly occur in the human mouth, but they were greatly in excess of the number usually present; and especially noticeable was the prevalence of filamentous forms. These organisms were formerly grouped under the name of Leptothrix buccalis, but it is now definitely known that several distinct species of mouth bacteria form threads. In our preparations we were able to recognise the two varieties mentioned above (B. bucc. max. and L. innom.). There were probably other kinds present, but their recognition is difficult owing to the fact that they will not grow on any of the known culture media, and so cannot be isolated and studied. These organisms are not considered to have any pathological significance, but to lead a saprophytic existence in the buccal secretion, feeding on the *débris* of food, shed epithelial cells, &c.

---

* Microorganisms of the human mouth.

These Leptothriceæ, mixed with epithelial cells, other bacteria and *débris*, had accumulated to an excessive extent in the crypts of the tonsils of our patient. On what factors this undue accumulation depends we have no evidence to show. Catarrhal conditions, which are made to serve as the prelude to almost all other diseases of the throat, may possibly predispose to this also. We may be permitted to mention that during a series of examinations of material obtained from the throats of patients suspected of having diphtheria, one of us (T.) has met with two instances in which the "false membrane" presented similar microscopical features to those of the growths described above.

In none of the ordinary text-books on pathology, bacteriology, &c., to which we had access could we find any mention of these growths being caused by the organisms in question. Schech, however, in his well-known work,* gives the following account of such a condition under the name of "mycosis tonsillaris." He states the affection was first described by Bernard Fränkel in 1873, and by him called "mycosis tonsillaris benigna." It is identical with the "pharyngo-mycosis leptothricia" of Hering. "By these terms is understood," continues Schech, "a disease of the tonsils and base of the tongue, which manifests itself in whitish or yellowish-gray soft, sometimes horny, and often pedunculated tubercles or thorn-like excrescences. They are situated on the surface and in the lacunæ of the tonsils, more rarely on the pillars of the fauces and posterior wall, and the deep parts of the lateral folds are sometimes occupied by them. . . . The subjective symptoms are itching, burning, dryness, slight pain on swallowing, and a tendency to hawk and cough. In some cases fever, with loss of appetite and lassitude, precedes the actual outbreak of the spots; in others there are no symptoms whatever, and the patients only become aware of their condition on examining their throats. . . . Microscopic examinations of the spots just mentioned reveals the presence of very numerous micro-organisms, the naming of which is still a matter of dispute. In the case communicated by Fränkel, and in the one observed by myself, the tubercles consisted entirely of bacilli and rounded cocci; in that published by Eugen Fränkel, and analysed by Sadebeck, a peculiar bacillus was found, which, on account of its appearing in tufts, was called *bacillus fasciculatus*. Hering, who examined six cases himself, came to the conclusion, already come to by Klebs, that the discovered fungus mass consisted of leptothrix." Schech adds that the affection is very obstinate, as whenever the masses are removed by operation they immediately become reproduced.

---

* "Diseases of the Mouth, Throat, and Nose." Translated by Blackie, Edinburgh, 1886; page 181.

Lennox Browne* remarks that excessive fungoid growths in the throat are rare in England. He had seen few such cases, and "in every instance the pathological report has been that leptothrix has been the prevailing vegetable parasite present."

The clinical and bacterial features of our case exhibit such perfect parallelism with the descriptions quoted as to leave no doubt in our minds that our patient was suffering from pharyngomycosis leptothricia. On enquiring further into the literature of the subject, we find that short accounts of the condition are given by McBride † and by Miller,‡ whilst cases are described by Clarence C. Rice § and by Barker.‖ In the report of the Second Intercolonial Medical Congress (Sydney, 1892), Dr. J. A. Dick ¶ gives an account of a case of pharyngeal disease which agrees in its general characters with that described by us. The disease in this case, however, is ascribed to a different fungus.

According to the authorities the condition is a rare one in England, on the Continent of Europe, and in America. Conversation with medical friends would lead to the belief that such conditions of the throat are, at least, not uncommon in Sydney. We have therefore considered it advisable to publish our case in the hope that, by drawing attention to it, further information will be forthcoming with regard to this apparently little known condition.

Before concluding, we wish to refer to the fact that our patient suffered from asthma. A point of interest to us was whether this was due, in a reflex way, to the throat condition. A careful study of the case led us to the conclusion that the asthmatical attacks had no dependence on the growths; on the other hand, it is possible that the lowered vitality due to the asthma may have predisposed to the accumulation of leptothrix.

ADDENDUM.—Since the above was written a second case has come under our notice. The patient, a child aged two years, was suffering from ozœna, for which advice was sought. She was rather delicate, but had not been definitely ill lately. On examining the throat we found eight or ten small white projections on the left velum palati, forming a line near, and parallel to, its free edge. The adjacent palate presented the appearances of subacute inflammation. There were no symptoms attributable to the growths, and, indeed, their presence was not even suspected till they were found by us. The tonsils and pharynx were free from growths. The mouth appeared to have received reasonable attention as to cleanliness. The growths in this case were soft, porcelain white in colour, and were readily scraped off without bleeding or leaving depressions. Their microscopical appearances were practically the same as those of the first case.

---

* "The Throat and Nose, and their Diseases"; 4th ed., 1893; p. 260.

† "Diseases of the Throat and Nose."

‡ *Loc. cit.*

§ International Clinics; V. 3, 1892; p. 343.

‖ John Hopkins' Hospital Bulletin; V. vi.; Nos. 50-51; p. 93.

¶ A Case of Parasitic Disease of the Pharynx; p. 482.

THE TREATMENT OF ANCHYLOSTOMIASIS.

By A. Jefferis Turner, M.D. Lond., M.R.C.S. Eng.

Physician for Out-patients, Hospital for Sick Children, Brisbane.

At the last Intercolonial Medical Congress, held in Sydney, a paper was read by Dr. Lockhart Gibson and myself dealing principally with the symptomatology and diagnosis of this parasitic disease. The object of the present paper is to deal more particularly with experience that has been recently gained as to its treatment.

But before doing this it may be of interest to refer briefly to the present state of our knowledge as to the distribution of anchylostoma duodenale in Australia. The first case recorded is that of an adult male, inmate of the lunatic asylum, Goodna, published by Dr. Hogg in 1889. Dr. Hogg, in searching, *post mortem*, for the cause of the well-marked anæmia from which the patient suffered during life, found large numbers of anchylostoma in the intestine. No further case appears to have been recognised until March, 1892, when the disease was discovered in two children from Cairns by Dr. Gibson and myself, the diagnosis being made by the detection of the characteristic ova in the fæces, and subsequently confirmed by the expulsion of a few specimens of the adult worm. These cases were shown at the time at a meeting of the Medical Society of Queensland. Another case from Mackay, also in Northern Queensland, was recognised in June, and these three cases are fully described in the paper referred to above. A few months later* Dr. Bacot, of Townsville, described two cases also in children from Cairns. During a recent visit to Townsville I was shown a typical case in that city by Dr. Nesbitt, and from conversation with him and Dr. Bacot I gathered that the disease was commonly prevalent in the north, and was proving itself a serious scourge among children.

That the disease also existed in Southern Queensland was demonstrated by the case of a male adult shown by Dr. Gibson at the meeting of the Medical Society of Queensland in November, 1892. This man, thirty years of age, had been ten years in Australia, and had lived all that time in Maryborough. He was sent down to the benevolent asylum in consequence of anæmia, supposed to be pernicious anæmia, until Dr. Gibson demonstrated its real nature. Shortly afterwards this man died from an intercurrent attack of influenza, and large numbers of anchylostoma were found, *post mortem*. Cases have also been recognised in the Children's Hospital in the children of three or four families residing in the sparsely populated coast district between Gympie and Brisbane. Lately also a case has been recorded by Dr. Lawes† from the Tweed River just across the northern border of New South Wales.

To sum up, the disease is so far only known from the coastal districts. In Northern Queensland it appears to be common, in Southern Queensland it appears to be as yet not very common, though doubtless there are many unrecognised cases; and it has been proved to extend into the northern districts of New South Wales. In Southern Queensland at least it appears to be mainly a disease of the country districts. No cases have yet been observed among Brisbane children, though it exists both to the north and south of that city. There can be little doubt that the disease has existed among us for a long time unrecognised, and that cases are still being passed over by medical men who are not on the look out for it. But whether the parasite is really indigenous appears to me very doubtful. It is of course impossible to prove the contrary. But I think it is more probable that it was introduced by immigrants, more especially from Southern Asia, where it is exceedingly prevalent, and that it is gradually spreading, being conveyed from place to place by human intercourse. Although most abundant in warm countries it is an error to regard the disease as necessarily confined to the tropics. It is extensively prevalent in Southern Europe, and in Germany it extends as far north as Dortmund, in Westphalia,* a town on the same latitude as London. Roughly speaking its northern limit in Europe coincides with that of the vine. There is nothing, therefore, in climatic conditions to prevent the disease from becoming prevalent in all the Australian Colonies. It is quite possible that it is already far more widely distributed than is recognised.

---

* *Australasian Medical Gazette*, December, 1895.

† *Australasian Medical Gazette*, November, 1895.

It would unnecessarily lengthen this paper to describe once more the symptoms of anchylostomiasis in detail. They may be shortly and satisfactorily indicated in one word—anæmia. In children a depraved appetite for earth or dirt is sometimes a conspicuous symptom, but this is by no means always present, nor is it exclusively characteristic of the disease. The anæmia varies from a slight to the gravest and most severe form. Death is not uncommon, either from intense anæmia, complicated towards the end by dropsical effusions and heart failure, or perhaps more commonly from some intercurrent affection carrying off the already weakened patient.

The diagnosis of the disease is exceedingly easy. All that is necessary is to place a minute fragment of the fæces on a microscope slide, diluting it if necessary with a drop of water, and examine it under a low power of the microscope. A higher power may be employed to examine any ova discovered, but any ordinary microscope is sufficient. The ova are so extraordinarily numerous that they are scarcely ever to be missed on the first examination. They are easily recognised, and once recognised are absolutely characteristic. A rough sketch of their form will be found illustrating the paper of Dr. Gibson and myself, and they are also figured in many systematic works.

The disease is curable. By cure is, of course, meant the removal of the cause of the symptoms by the expulsion of the worms. Under improved hygienic conditions and the administration of iron and arsenic the symptoms of anæmia may be much alleviated, and the case may even be regarded as cured. But this is a grave error. The patient is almost sure to relapse into his former condition sooner or later. The disease is never cured spontaneously.† It is evident that the worm must be expelled, and that the only sign of a real cure is the prolongd absence of ova from the fæces.

The anchylostoma is not an easy parasite to dislodge. Our first experiments at the Children's Hospital were unsuccessful. Calomel, santonin, male fern, naphthalin, thymol, naphthol, and other drugs were administered with disappointing results. The number of worms found by careful examination of the fæces was very meagre; ova remained abundantly evident on microscopical examination; and although some cases were discharged symptomatically improved, they returned to the hospital one or two years later with a relapse of their former symptoms. The drug which has been most lauded in the treatment, and from which most was expected—thymol—received a particularly persevering trial, without success.

---

* "Sonsino, Hygiene and Diseases of Warm Climates," edited by Davidson; p. 874.

† Sonsino. *Loc. cit.*; p. 894.

After reading the article by Sonsino already mentioned I was induced to give thymol a further trial. Ordinary doses, such as five grains given three times a day, I had found to be useless. But Sosino recommends as much as six to eight grammes to be given to an adult in the course of a few hours. Closely following his method, I subjected a boy, aged seven years, who had been unsuccessfully treated two years before, to the following routine:—For one day he was kept on strict milk diet, and an aperient administered. The next morning he was given four 10-grain doses of thymol at hourly intervals, being allowed only water to drink in the intervals. The milk diet was enforced till the evening, when the bowels were cleared out by a saline aperient. In this way a great many worms were expelled. A week later the same routine was repeated, except that four 15-grain doses were given, and this was repeated on a third occasion. Since then his fæces have been repeatedly examined for ova, without any being found.

Two additional cases have been similarly treated, and Dr. Ashworth, Resident Surgeon at the Children's Hospital, who has observed the action of the treatment with great care and thoroughness, has kindly supplied me with the following particulars:—In the second case, a child of four years, four 7½-grain doses of thymol were administered at hourly intervals. From the two evacuations which followed 200 worms were picked out. A week later the same doses were repeated, with the result that only six worms were found. A third repetition of the doses at weekly intervals was not followed by the appearance of any worms. Three weeks after the last dose no ova were discovered in the fæces on microscopical examination.

The third case was a boy aged nine years. He was given four 10-grain doses of thymol, and 280 worms were discovered in the first two motions passed subsequently. On two subsequent occasions, at weekly intervals, he was given four 15-grain doses. After the third week ova were no longer apparent in the fæces. Three weeks after this last dosage the ova still remained absent.

These three cases all belong to one family, and had suffered from the disease, not in its severest form, for over two years. Dr. Ashworth noted that the ova of tricocephalus were present in the last case, in addition to those of anchylostoma, and the former were still present after the treatment with thymol. This is interesting as showing that the drug is not equally efficacious against different species of intestinal worms. The situation of trichocephalus in the colon while anchylostoma inhabits the duodenum and jejunum may have something to do with the different effects of tho drug upon the two species.

The thymol should be given in powder. Adults would tako it most conveniently in capsules or wafers. We have not observed any toxic symptoms in our cases. The drug sometimes causes a burning sensation in the stomach, which is best relieved by drinking simple water. The chief difficulty in the treatment will probably be that the drug may be vomited. By strictly following the routine given above the likelihood of this is reduced to a minimum. Alcohol in any form must be prohibited during the treatment. The absence of toxic symptoms is probably due to the comparative insolubility of the thymol. It is readily soluble in alcohol, and cases have been recorded of severe toxic symptoms caused by the administration of alcohol while the patient was taking thymol.

We must not be satisfied as to the absence of the ova by a single examination. Several examinations should be made at intervals of a few days. Should only a few worms remain behind, the ova will be correspondingly scarce. I do not think, however, that there is any likelihood that any few individuals remaining behind would multiply *in situ.* Judging from all our knowledge of parasitic worms, it is necessary for the ova to leave the body of the host before undergoing further development.

The life-history of anchylostoma has not yet been fully determined; but it appears highly probable that the larval form inhabits damp earth or muddy water. It is evidently highly expedient that all individuals suffering from the presence of the parasite should undergo suitable medical treatment—not only for their own sakes, but to prevent them from spreading abroad the ova and so infecting others.

ON THE DIAGNOSIS OF REICHMANN'S DISEASE AND SOME OTHER STOMACH CONDITIONS.

By D. Colquhoun, M.D. Lond., M.R.C.P. Lond., Dunedin.

Reichmann has described a condition of continuous and periodic excessive secretion of gastric juice, with excess of hydrochloric acid and dilatation of the stomach. Ewald speaks of the flow of gastric juice of Reichmann as a neurosis, and although it has been frequently observed and commented on, the name Reichmann's disease has been already bestowed on it by some American and European writers. Strong objection has been taken by many medical men to the multiplication of special names for diseases, and in this case I am certainly not going to apologise for it, nor find fault with it. Speaking for myself only, I would express the opinion that a new point of departure has been arrived at in the diagnosis and treatment of chronic stomach diseases, and that for the new methods we have chiefly to thank German observers.

In the work of Ewald on diseases of the stomach, published by the Sydenham Society, these methods are described with authority, and (I express the opinion with some diffidence) since Bright wrote on albuminuria it appears to me that no more important medical work has been given to the medical profession. Not that Ewald's work can claim the originality of Bright's, for while it is full of personal work it does not claim to do more than place before physicians the results of the labours of many workers, among whom he is himself not the least distinguished. The chief merit of the new method lies in the exact observation of the gastric secretions, and the demonstration of the ease with which the contents of the stomach can be obtained and tested. Briefly, the mode of procedure is as follows:—The usual physical examination is made and history obtained; any matter vomited is examined in the usual way with the microscope and by the naked eye, it is then filtered, and the filtrate is tested for acidity with test paper, and by a standard solution as to total acidity; tests for Hcl. and lactic acid are then applied if acid is present. The Hcl. test we have found most convenient is that of Boas—a solution of resorcin in spirit, with sugar. The digestive power of the filtrate is then tried with milk, white of egg, and minced meat. If Hcl. is absent, that is added, and the peptonising power of the secretion is tested by examining for peptones. For testing the motor power of the stomach—that is, its capacity for passing on its contents to the duodenum—salol is given. This drug is decomposed by the pancreatic secretion, and the presence of salicyluric acid in the urine is considered proof that the stomach contents have reached the duodenum.

In addition to testing vomited matter the contents of the stomach are obtained by means of a soft rubber tube and ball syringe. This is usually done in the morning, and a test breakfast (Ewald's plan) is given if the stomach is found to be empty. This consists of a dry roll and about three-quarters of a pint of warm water or weak tea, taken an hour before the introduction of the tube.

I have used these methods in the wards of Dunedin Hospital and in private practice during the last twelve months, and the following cases will illustrate the kind of information and results obtained:—

Wm. C., stonemason, aged 45 years, was admitted to the hospital 16th May, 1895. He had suffered from indigestion, with occasional vomiting, for two years. Worry or exertion always made him worse. Five weeks before admission he had to give up work, and had recently vomited black coffee-ground stuff. His weight had fallen from 10 stone to 8 stone 5¾ lbs.; appetite was good, as a rule; and he complained a good deal of thirst. If he took solid food, pain came on about half an hour afterwards. Pain began in epigastrium, worked through to his back, and was always followed by vomiting. The vomit was at first ropy, then watery, and finally coffee-ground. Latterly the stools occasionally had been tarry. His family history showed that his father and seven brothers and sisters had died of phthisis. Personally he had been temperate and hard working, and had enjoyed moderately good health. The chief organs were healthy, but a tender spot could be made out on deep pressure midway between the umbilicus and ensiform cartilage; liver, dullness normal; left supraclavicular glands slightly enlarged. A light diet was given, and for several days the stomach tube was tried for a short time each morning. No practical difficulty was found in this or other cases, and on the 21st May Ewald's test breakfast was given, and after an hour the contents of the stomach were removed. Examination showed an abundance of Hcl. peptones were present, the milk-curdling ferment acted well, and white of egg was well digested. No blood was found. Several examinations showed similar results, the Hcl. being rather below the normal when tested quantitatively.

Diagnosis.—The man's age, family history, loss of weight, the suspicious enlargement of the supraclavicular glands, the local tenderness and upper ground vomit justified a strong suspicion of cancer. The presence of a considerable amount of Hcl. and the behaviour of the stomach filtrate suggested a more favourable diagnosis, which was apparently confirmed by his steady improvement during the next month. On the 30th May his weight was 8 stone 9½lbs.; he was able to take a little solid food; vomiting and pain had ceased. Hcl. was constantly present in the stomach contents, and when he left the hospital on 12th June he weighed 8 stone 11lbs., and was taking nearly ordinary diet—in fact, a dyspeptic's ordinary diet. I am inclined to think that in this case there was—first, disordered secretion, and, secondly, gastric ulcer of a simple kind, but there is no positive proof of the relation of events to each other.

Daniel C., aged 39 years, labourer, was admitted to the hospital on the 7th August, 1895. He had been ill 12 months, suffering from pyrosis and sickness about an hour after taking food. Illness steadily increased until four months before admission, when he had to consult a medical man. He had a good deal of constipation, and pain in the stomach. On the morning of admission he vomited a considerable quantity of bright-coloured blood, and during the day further quantities, so that he fainted. His family history was good; no trace of cancer or phthisis. He had been a temperate, hard-working man, always having abundance of food, but of the rough kind as to cooking, &c., usual in the country. During the twelve months before admission he had lost about two stone in weight. On examination he was found to be pale and emaciated; heart, lungs, and urine were normal. Careful examination of the abdomen showed nothing abnormal; no swelling, and only slight tenderness at a spot half an inch to the right of middle line and 1½ inches above umbilicus. Supraclavicular glands were not enlarged. There was no vomiting after admission, but motions at first passed were tarry, and he remained anæmic and complained a good deal of pain after taking any food. As he had evidently ulceration of the stomach, and a large vessel probably had been opened, the stomach-tube was not used until 8th September. There was a good deal of mucus in the washings, which were acid but contained no Hcl., and had very feeble digestive powers. Repeated examination of the stomach contents early in the morning, and after a test breakfast showed the same condition. Hcl. was always absent, lactic acid could be easily demonstrated, and the digestive action on proteids was very feeble.

Diagnosis.—The permanent absence of Hcl., with undoubted ulcerative changes, made the diagnosis of cancer extremely probable. In other respects it looked less like cancerous and more like simple ulceration than the previous case. The man left the hospital on 24th September, and became steadily weaker. He died about six weeks later, but I have no means of finding out if he developed any new symptoms before his death.

Albert M, aged 27, clerk, was admitted on June 3, 1895. He complained of pain and vomiting; the pain began four months before admission, was constant day and night until eight weeks before, when vomiting began. Since he was a boy at school, he had always been troubled with his stomach, would often have a remission of six months at a time. The chief symptom was pain, which was independent of food taken. His family history was good; he had led an active life, going in a good deal for various sports.

The vomited matter was sour, frothy, and full of mucus, and about two quarts at a time came up. There was no blood in the vomit, or dark stuff, or melena. Gaseous eruclation and profuse salivation usually preceeded vomiting. On examination he was a spare, well-built, healthy-looking man; heart, lungs, and abdomen seemed normal; urine was alkaline and full of phosphates; pulse, 150.

He was of nervous and somewhat irritable temper; tongue clean; no constipation; appetite poor, but good as a rule. More minute examination showed dilation of the stomach, the stomach contents, removed by means of the tube, were very acid, contained 40 to 50 per cent. excess of Hcl., and had strong peptonising powers. The stomach, early in the morning before food had been taken, contained a good deal of acid gastric juice stained with bile.

Diagnosis.—This seemed to be a case of the kind described by Reichmann—a hyper-secretion of gastric juice, tolerably constant in character, leading to or associated with dilatation of the stomach. In their worst forms such cases closely resemble malignant disease of the stomach. Those attacked are always neurotic subjects. The course of this case was favourable, and patient left the hospital on 17th June, able to digest ordinary food, and returned to work.

Peter O., aged 43 years, a seaman, was admitted on 15th June, 1895. He had to cease his work as a seaman seven or eight years ago on account of indigestion, which has troubled him ever since. He complained of pains in the stomach and vomiting two to four hours after food. Vomit was yeasty, large in amount; contained no blood or black stuff, no melena. Examination showed patient to be spare, 7 stone 8lbs. (best weight 9 stone); heart, lungs, abdomen normal; pulse 52; urine alkaline, full of phosphates, no albumen, no sugar. He complained of a tender spot at epigastrium, to the right of middle line. Appetite fair. Stomach contents, examined after a test breakfast, showed presence of Hcl. in considerable excess of normal; an active rennet ferment and active pepsin. He was discharged on 11th June, much improved, able to take ordinary diet, with certain restrictions.

Diagnosis.—This was probably a case of gastric dilatation and hypersecretion going on more or less continuously. There was no history of hemorrhage, but the case might well have been one of gastric ulcer. His thin, miserable appearance, and in the absence of proof to the contrary, might easily have led one to suspect malignancy.

Mary D., aged 55 years, was admitted on 10th September, 1895. This was a case of well-marked abdominal cancer. A large craggy tumour could be felt just below the umbilicus, extending towards the left inguinal region. There had been frequent black and coffee-ground vomit, the stomach was dilated, and the mass was not improbably springing from its lower order. It is merely noted here, as several examinations of the vomited matter and washings showed no trace of Hcl. at any time. Lactic acid was present in small amount. Under no circumstances could there have been any doubt as to the diagnosis at the stage presented to us on her appearance at the hospital.

Thos. P., aged 42 years, engineer, admitted 1st July, 1884. In this case there was little doubt as to the diagnosis. A hard lump could be felt in the epigastrium, patient's weight had fallen to 10 stone (from 15 stone) in six months, and vomiting and pain were constant and severe. There was melena while he was in the hospital, which was only for about six days, as he was anxious to return home. He died on the 24th July. Examination of the vomit showed each time it was made, absence of Hcl. and practically no digestive power.

John McL., aged 40 years, shearer, admitted 10th July, 1894. He was in the hospital twelve months before complaining (as at this time) of vomiting and pain. Illness began two years ago with vomiting and pain, and this had continued at intervals ever since. Vomit at times was brown. His family history was good. and he had always been healthy and temperate, but he had been accustomed for some years to the usual bush diet. Examination: Weight, 10 stone (best, 11 stone 10 lbs.); appetite good; tongue brown, indented with teeth; teeth bad. Stomach region on examination seemed normal. There was a well marked mitral systolic murmur. Urine normal; lungs normal. Stomach contents examined were acid, contained considerable quantity Hcl., and the stomach was much dilated.

Diagnosis.—Hyperacidity and dilatation of the stomach. He improved much under treatment, and left the hospital on 3rd August.

Walter G., aged 49 years, admitted 22nd April, 1895. Patient was in hospital three years ago with symptoms of ulceration of stomach, and had not been well since. He had almost constant vomiting after food, the vomit being copious, yeasty, and lately coffee-coloured at times. Weight, 8 stone (best, 11 stone 8 lbs.) Heart and lungs normal; urine alkaline—no albumin and no sugar. The stomach was much dilated, and when emptied in the morning sometimes contained as much as two pints of fluid, blood-stained and very acid. There was a good deal of Hcl. (at one time 50 per cent. above the normal), and peptones were abundant. Neurotic symptoms were marked, patient being singularly difficult to deal with, and always trying to evade the regulations as to diet, rest. &c. He gained in weight and improved under treatment, but left the hospital on account of private business in an unsatisfactory state on 25th June. He then weighed 8 stone 6 lbs., and sickness had ceased. He was subsequently admitted as a case of "suspected cancer."

Diagnosis.—Here the examination of the vomited matter and washings showed that cancer was not present. This was confirmed by the partial improvement. There was hypersecretion of the gastric juice, probably associated with simple ulceration, pyloric stenosis, and gastric dilatation.

Fred Holmes, aged 57 years, clerk, admitted 27th March, 1895. He complained of vomiting after food. This began three months before admission, and consisted of mucus and bile, but not of food. There was no blood at any time in the vomit. Bowels had been irregular for some time. The history taken showed that he now lost weight very rapidly, best weight 17 stone. About Christmas, 1894, when he began to feel low, 13 stone; 27th March, 9 stone 10 lbs. His family and previous history were both good. Heart and lungs normal; urine acid normal. The stomach tube could not be passed into the stomach, but was arrested evidently about the œsophageal opening. Fluid passed in was not returned, but some alkaline fluid was vomited. This contained of course no Hcl., and had no digestive power. He soon was unable to swallow solid food, and on 21st June, my colleague, Dr. Barnett, performed gastrotomy for the purpose of prolonging life and relieving pain. The case is reported in its later stages in the *New Zealand Medical Journal* of January, 1896.

Diagnosis.—Cancer of the lower end of œsophagus or cardiac end of the stomach, partially blocking the œsophagus, with a pouch above the cancer. This diagnosis was arrived at early, and was confirmed about 10th June by the discovery of a tumour under the xiphoid cartilage, which increased while he was under observation. In this case, after the stomach was opened, frequent examination of the stomach contents showed persistent absence of hydrochloric acid.

Andrew G., aged 58 years, admitted 17th June, 1895. This patient was only in the hospital for two days, but his symptoms were characteristic. He had been ill for ten months, and during that time his weight had gone down from 10 stone 10 lbs. to 8 stone 2 lbs. He had for three or four months complained of severe gastric pain, aggravated by food, and had vomited very large quantities of liquid stuff, lately only black or coffee grounds in character. The vomit examined was acid, but under the normal, contained lactic lacid, but no Hcl., and had no digestive power. No tumour could be felt.

Diagnosis.—Cancer of the pyloric region, with stenosis and dilation of stomach. He died soon after his removal to his home, but no *post mortem* was obtained.

George B., aged 59 years, farmer, admitted on 17th January, 1896. He complained of great weakness, loss of flesh, pain, and vomiting. His illness began in April, 1895, and he thinks it was caused by over-exertion and over-excitement in trying to save his oats, which had caught fire. Directly after that he suffered from indigestion, pain, and flatulence, but did not vomit. He thought he passed black motions. Two months ago he vomited some dark stuff, and vomiting has been copious and yeasty as a rule. Family and personal history were excellent. His lungs, heart, and abdomen were normal. Urine alkaline, full of phosphates, no albumen, no sugar. His appearance was wasted and anæmic; weight 9 stone 5 lbs. his best having been 11 stone 11 lbs. Gastric contents evacuated early in the morning before food consisted of about a pint of bile stained dark, very acid fluid. On one occasion the acidity was about 40, on another 50, above the normal. Hcl. was present, and the filtered fluid had strong peptonising powers. This patient is still under treatment in the hospital.

Diagnosis.—Hyperacidity, dilatation, and ulceration of the stomach. It seems not unlikely that this was primarily such a case as Reichmann describes, but the relation of hyperacidity to gastric ulceration is not sufficiently known to enable an exact diagnosis to be arrived at. The first event may have been a mechanical injury due to over-exertion, or it may have been perverted secretion owing to over-excitement.

Remarks.—I would note that I have not attempted to deal with the treatment of these cases, as that would have lengthened this paper unduly. I may be wrong in supposing that systematic examination of the stomach contents is not universally practised in conditions of chronic gastric trouble.

If so, this paper is quite useless; but if I am correct, I would desire to call attention to the need of such examinations for the purpose of diagnosis. Much more information will be collected as to stomach conditions in future, and dogmatic assertions as to the meaning of results obtained are as well avoided. It will be noticed that nearly all the cases occurred among men of middle life. Few females are in the list. In this respect, these cases of hyperacidity, dilatation, and cancer of the stomach, present a striking contrast to cases of acute gastric ulcer. Another point worth noticing is the way in which cancer and hyperacidity each seem to go their own way. Elsewhere we expect that long continued irritation and ulceration will often be followed by cancer. The chronicity of these non-malignant stomach cases, without malignancy supervening, seems to me remarkable. It is possible even that the hyperacid secretion and cancer are incompatible. I can remember no such case ending in cancer.

ON ACROMEGALY.

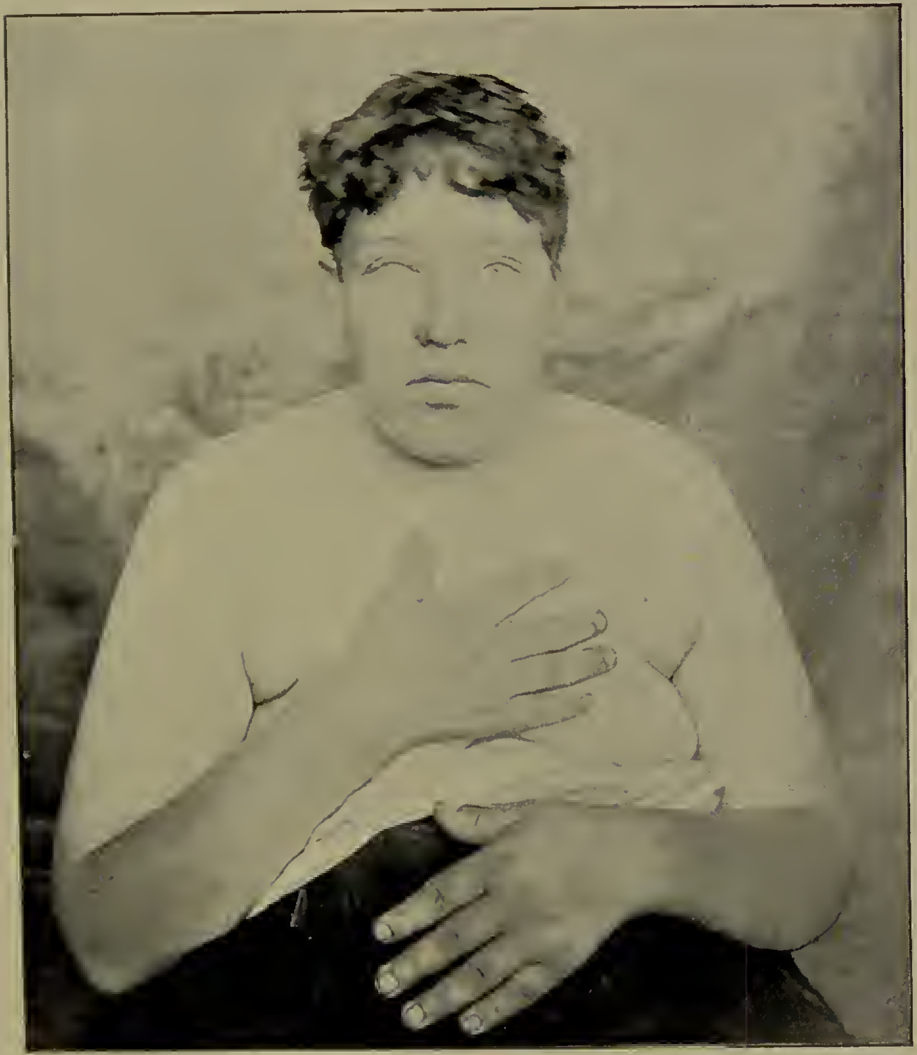
By R. Scot Skirving, M.B.,

Lecturer in Clinical Medicine, Sydney University, Honorary Physician to the Prince Alfred Hospital, Sydney.

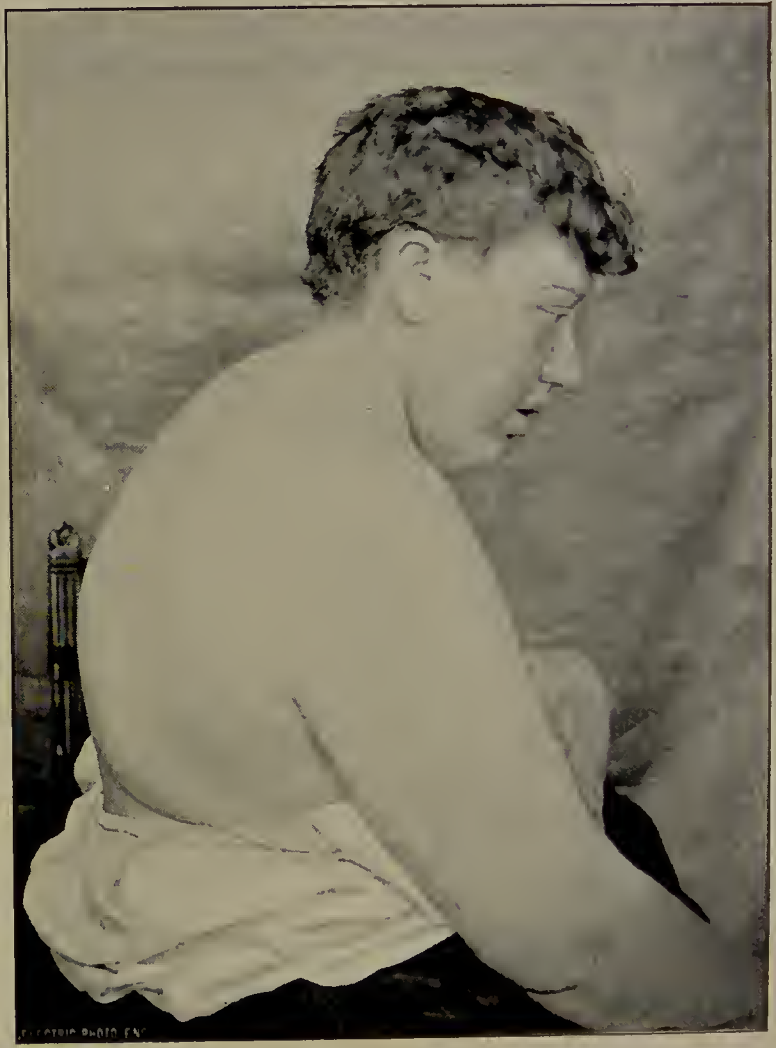
It is always of interest in a new country to note if disease assumes the same type as is met with in older communities, and it is also not without interest to observe if diseases rarely seen at Home occur at all, or proportionately in greater numbers, at the Antipodes. I have therefore thought it not without profit to put on record my experience of acromegaly. Since Marie's paper was published I have seen in Sydney no less than four cases, one of which, however, I must say at once is believed to be a case of rheumatoid arthritis by a very able colleague. Another case has come under my notice in which there existed a tumour occupying the position of the pituitary body, but without the common signs of acromegaly. I will briefly record these cases.

Case I.—A girl of 18 or 20, with enlarged face, hands, and feet, and obstinate head pains and amenorrhœa. No special notes were, unfortunately, taken. The patient passed rapidly from under my observation; still I suspected then, and feel certain now, that it was a case of acromegaly. From the knowledge so gained I was able on visiting Edinburgh in 1893 to correctly diagnose a case shown me by Dr. B. Bramwell.

Case II.—A widow lady between 50 and 60, who during the last few years has suffered a good deal from aching pains in her joints, accompanied by some weakness. She has had a great deal of domestic trouble. What brought her to me was the pain, and also the increase of size she had noted in her hands and feet. Her face likewise was characteristically altered in shape. She had headache, but no vomiting. The urine contained no sugar or albumen. I thought the speech a little slow. No change existed in the fundus. A perimetric examination was not made. Dr. Sydney Jones and



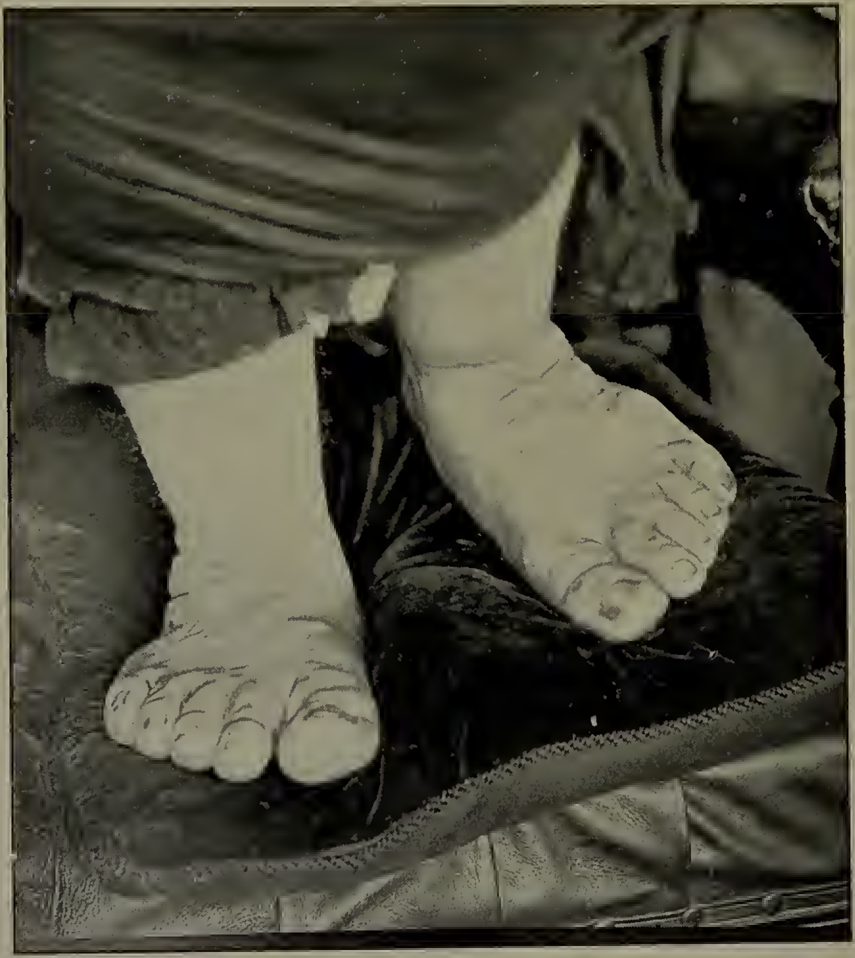
K.E.W. — Shewing facial expression and hands.



K.E.W.—Shewing spinal curvature and profile.

[From a photograph by Dr. W. H. O'Neill.]

BURROUGHS, WELLCOME & Co.
LIBRARY
No.



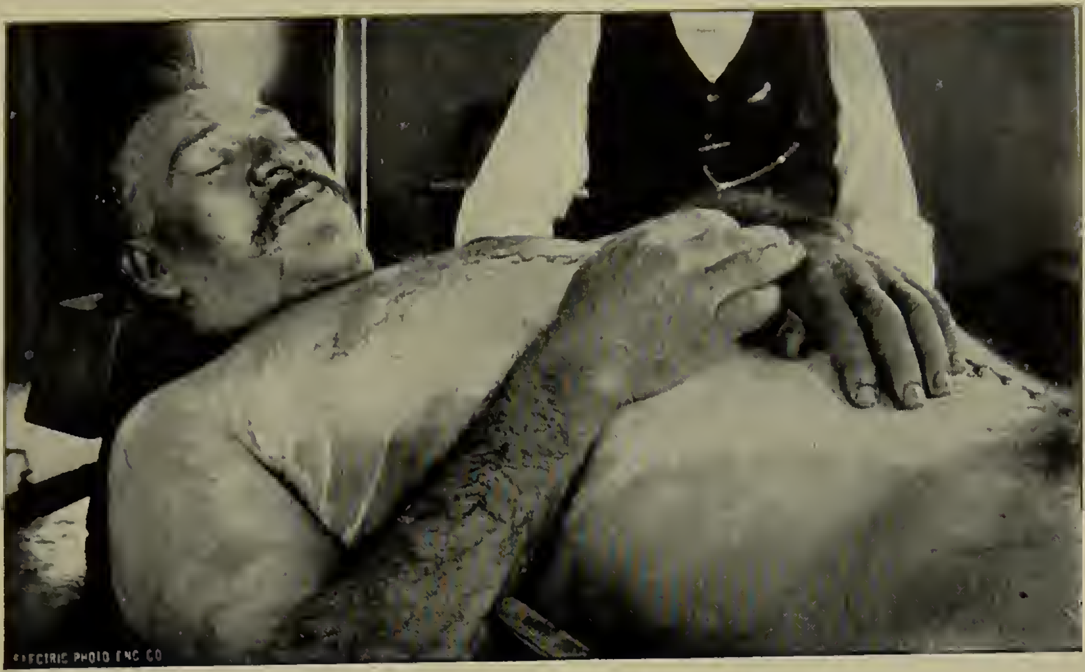
K.E.W.—Shewing condition of feet.
[From a photograph by Dr. W. H. O'Neill.]

Dr. Purser both saw her independently of me, and regard the case as Acromegaly. The former had known her well in earlier years, and was at once struck with the facial change and the size of the hands and feet. The diagnosis in this case lay between acromegaly, osteitis deformans, and rheumatoid arthritis. I again must add that a valued colleague strongly regards this case as one of rheumatoid arthritis.

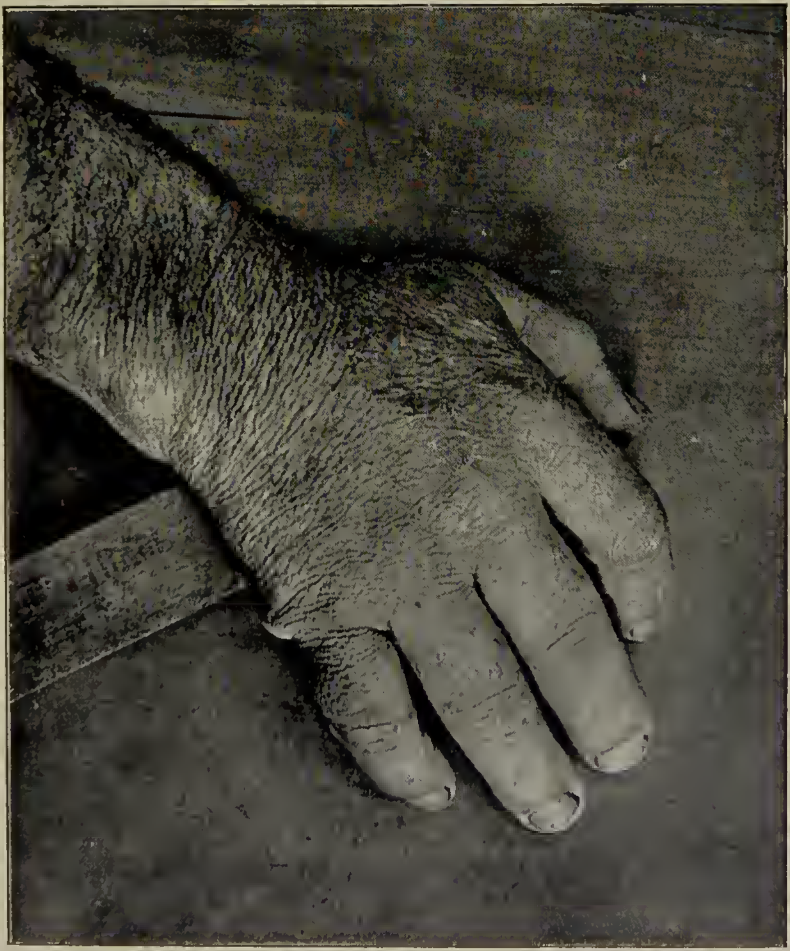
Case III.—K.E.W., aged 25 years, a woman, was sent to me at St. Vincent's Hospital in February, 1895, by Dr. Brereton, of Nowra. Patient was the smallest baby of a family of twelve, and was an ordinary sized child, with very small bones, till 12 years of age. Since then she has steadily and abnormally increased in size, till she has attained her present mammoth-like proportions. She is 5 feet 7 inches in height, and weighs nearly 20 stone. She was, later on in the year, under my care at Prince Alfred Hospital, when she was given pituitary extract, and I had an opportunity of demonstrating the case to my class. Her family history is unimportant, save some instances of rheumatism. Three years ago she began to suffer from severe aching pains in her arm, and wrist, and shoulder joint. This was regarded by her as rheumatism. Her whole body is enormously increased in size, but her muscles are flabby and ill-developed ; the head is specially altered ; the face is oval in shape, with the broad end downwards ; the forehead is compressed laterally ; the cheek bones and supraciliary ridges are prominent ; the lips are greatly thickened, and the teeth in the lower jaw are slightly separated ; the tongue is very large ; no thyroid gland can be definitely felt ; the hair is not atrophied ; the nails were striated, but this has disappeared during the last few months ; when first seen (her back especially) she was covered with countless tiny molluscal tumours—these have now almost entirely disappeared ; the nostrils are large and widely separated ; there is marked kyphosis of the spinal column. Measurement of head—Round the cranium, from lambda to chin, 30 inches ; at level of ears, 26 inches ; from forehead to chin, 10 inches. The hands are huge and flabby ; they are flattened from before backwards, with especial flattening at the joint between the first and second phalanges ; there is over-extension here ; the whole hand is dumpy and soft ; it measures 12 inches across the distal end of the metacarpus. The feet—The normal curve of the sole is obliterated on the outer side of the foot, owing to excessive over-growth of soft tissue ; the feet are greatly increased in size, the big toe especially ; length of foot, 11 inches ; breadth at base of toes, 6 inches, at heel, 4 inches ; the bones seem larger than normal. In the morning, before food, if she moves about, she vomits or retches ; the breasts are very small and ill-developed ; there is apparently some impaired resonance over the manubrium sterni ; heart and lungs are normal ; her menstrual function has never been established ; her uterus is of the senile type ; the vagina, capacious, but has no rugæ. Nervous system—She has had more or less constant headache for several years, but since treatment was begun at St. Vincent's Hospital this symptom has passed away to a large extent. She is childish in manner, and cerebrates slowly ; she is interested in two things only of time and sense—viz., her meals, and the hours they are served at ; her voice has a curious croaky, half-masculine tone ; her memory is poor ; she has no actual paralysis of motion or sensation anywhere, but she is getting feebler, and her grasp of hand is very poor ; the reflexes, superficial and deep, are practically normal ; muscular sense and co-ordination perfect ; the bladder and rectum act naturally ; the urine contains neither sugar nor albumen. On

3rd March, 1895, at St. Vincent's Hospital, Dr. Kenna reported as follows:—"The right pupil does not react to light, but it does to accommodation; the left reacts both to light and accommodation; there is atrophy of the right disc: the veins are rather dilated and tortuous; in the field of vision there exists left homonymous hemianopsia." In September, 1895, Dr. Pockly, at Prince Alfred Hospital, reported as follows:—"Pupils medium, react very feebly to light, especially the right, if at all. but they react to accommodation; V.R., finger, 1 foot; V.L., 6/18; vision in the right was too imperfect to test accurately; left eye shows temporal hemianopsia; there is paleness of the discs in both eyes, most marked in right eye; B.V. normal." I omit charts to save space.

Case IV.—J. J. R., aged 41, has nine children. Two years ago began to suffer from severe headache, chiefly in the left side; at times became strange and stupid in his manner. One year ago his hands and feet began to swell, and he used to have to put his feet in cold water before being able to get his boots on. Six months ago complained of slight loss of sight and difficulty of speech, and at times was especially dull and had difficulty in swallowing; fluid returning through his nose. The left eye was frequently very painful, and the lids inflamed. In walking he dragged his left foot, and occasionally fell down. On 14th June he was admitted into the St. George's Hospital at Kogarah, under Dr. Clay, who has kindly given me these notes. It was then noted that there was slight hemiplegia and facial palsy of the left side. The patient was very dull, and had great difficulty in speaking and swallowing. Temperature, 95; pulse, 70. Within a few hours of admission he lapsed into complete unconsciousness, with Cheyne-Stokes respiration and an irregular pulse. For two days he remained in this state, and appeared to be dying. On the morning of 17th June his breathing altered, and he slept normally. By the middle of the day he could understand what was said to him, but could not speak. Pulse, 108; temperature, 99·2. He now rapidly improved, but complained of pain in the left eye and left side of head. By the 25th June both the left hemiplegia and the difficulty of speech had practically disappeared. The patient seemed quite bright, and he was able to walk well. The fundus of the eyes was examined, and optic neuritis of the left disc was found, with one enormous vein extending from the upper to the lower part of fundus. He was occasionally seen in the street by Dr. Clay after his discharge complaining of debility, but becoming suddenly worse, he, after two days, was admitted to the Prince Alfred Hospital, under my care, in an unconscious condition, from which he did not rally, but died a few hours after admission. *Resumé* of *post mortem* examination by Dr. Rennie: "Well nourished; R. M. well marked; nasal cartilage large and thickened; large pad of fat above heel on each foot; feet short and broad, especially over roots of toes; toes broad, and not tapering; hands and fingers large, and not tapering; lips not specially thick; lower jaw is somewhat deepened, but not very prognathous; muscular system very well developed; heart, 23 ounces, considerably enlarged in all its cavities; liver, 108 ounces, enlarged and congested, soft and fatty. Head: Skull cap rather thin; convolutions flattened. On attempting to remove the brain there appears a tumour of the pituitary body, which is firmly adherent to the sella turcica, and is growing over left side of sphenoid. The sella turcica is widened, and the bone in neighbourhood is softened. The consistence of tumour is soft, and almost diffluent. On removal of brain, the tumour is seen to occupy the position of pituitary body. It extends into



J.J.R.—Shewing general appearance and hands.
[From a photograph by Mr. Broinowski, clinical clerk.]



J.J.R.—Shewing condition of hands.
[From a photograph by Mr. Broinowski, clinical clerk.]

BURROUGHS, WELLCOME & Co.
LIBRARY
No.

cavity of third ventricle, but lies loose in that cavity, the walls not being invaded. The optic tracts, nerves, and chiasma are compressed and adherent to the growth; large vessels at the base are atheromatous. Rest of brain is healthy. Measurement of parts: Right hand—maximum breadth, 5½ inches; middle finger—circumference of proximal phalanx, 3¼ inches; circumference of distal phalanx, 3 inches; breath of both proximal and distal phalanges practically identical—viz., 1 inch; angle of jaw to symphysis, 5½ inches; breadth of nostrils, 2⅛ inches; breadth of shoulder, 17 inches; circumference of root of great toe, almost 4 inches; circumference of ball of great toe, almost 4½ inches; face, 9½ by 5½ inches; circumference of wrist, 7 inches; height, 6 feet.

Case V.—The last case, which I wish to add as a pendant to the previous four, is one which was under the care of my friend and colleague, Dr. Chas. Maher, at St. Vincent's Hospital. I do not regard it as an example of acromegaly, although it presented certain symptoms of that disease, and the *post mortem* showed a tumour of the pituitary body. The following notes I owe to the courtesy of Dr. C. Maher:—R. D., aged 34, admitted to St. Vincent's Hospital on 5th August, 1895; had been in hospital ten months previously, when he was operated upon for fistula in ano. At that time he suffered from severe occipital pain and dizziness, and said he was subject to fits. There was a history of syphilis. There is no hospital record of the ophthalmoscopic examination or eye symptoms. A diagnosis of a cerebral tumour was made before he left the institution. Patient was readmitted on account of a fit. He was quite conscious, and complained much of severe occipital pain and also down the nape of the neck. The convulsions were tetanic, with marked opisthotonos, but without loss of consciousness. His muscular pains caused him to scream loudly. He died six hours after admission, of respiratory failure. P.M. report, also from Dr. Maher's notes:—Subject of medium height, corpulent, the chest and abdominal measurement being considerably above the average; some small fibrous tumours exist on the face, presence or absence elsewhere not noted; no marked prominence of lower jaw; extremities distinctly small; calvarium normal in thickness. On removing the brain a tumour was found projecting from the intra peduncular space and occupying the sella turcica, which was considerably widened out. The tumour, reddish in colour, was about the size of a pigeon's egg. It was somewhat lobulated, and at its inferior extremity was friable. It apparently arose from the pituitary body. It chiefly occupied the intra peduncular space, but extended backwards over the crura cerebri, while anteriorly a projecting lobule pressed on and flattened the left optic nerve, tract, and part of the chiasma. The bony ridges and prominences of the skull were well marked.

BURROUGHS, WELLCOME & Co.
LIBRARY
No.

—	ACROMEGALY.*	HYPERTROPHIC, PULMONARY OSTEO-ARTHROPATHY.*	MYXŒDEMA.	OSTEITIS DEFORMANS.	GIGANTISM.
HANDS AND ARMS ..	"Spade-like," enormously thickened and widened, though not lengthened; nails often striated; wrist in proportion to upper limb; as a rule, hypertrophy ceasing at wrist.	Enormous and deformed; not enlarged in carpo-metacarpal region, but in the fingers, especially the last phalanx; nails enlarged and curved; lower ends of radius and ulnar form an enormous projection above the hand.	Somewhat "spade-like," but not to the extent in acromegaly; no great enlargement of hands.	Long bones chiefly affected; deformities present in them; hands and feet escape for the most part.	No special change.
FEET AND LEGS ..	Similarly enlarged, thickened, and flattened; hypertrophy ceasing at ankle.	Like the hands—last phalan enlarged; ankle thickened and deformed.	Nothing very special.	Tibial curves; deformities of long bones.	No special change.
FACE AND HEAD ..	Face enlarged; an elongated oval, with large end of oval downwards; thick lips; flattened nose; large ears; prognathous lower jaw; large tongue; separation of teeth in lower jaw.	Not oval or enlarged; lower jaw not prognathous; lips and tongue not increased in size.	"Full-moon-like;" loss of eyebrows: dry, harsh hair, which falls out; forehead often bossy.	Face is oval, with large end uppermost; cranial bones being specially affected.	Unaltered, save general increase in size.
SPINE AND FIGURE ..	Marked cervico-dorsal curvature and slight lumbar lordosis.	Lower dorsal and lumbar curvature.	No curvature.	Shortening of height – due to tibial curves.	Normal; all parts of body enlarged in normal relationship to each other.
URINE	Often sugar; albumen not uncommon.		Albumen sometimes.		
GENERAL	Altered voice; headache; vomiting; ocular disturbances; fundal changes; molluscal tumours; cessation or non-establishment of menstruation.	Some respiratory lesion exists, or has preceded the symptoms — *e.g.*, empyema (two cases), neoplasm of lung (two cases), bronchitic affections (three cases).	Mental hebetude; slow speech; fatty tumours in neck; absence of thyroid, solid œdema of subcutaneous tissues; no ocular troubles.	Invasion quite non-symmetrical, whereas in acromegaly symmetrical invasion is the rule; no ocular troubles; shows itself after 40.	Nothing special. Gigantism appears during the period of active growth.

---

* In the preparation of these two columns I have largely availed myself of Dr. Springthorpe's kind permission to use his paper.

These cases, then, form a considerable experience of this rare disease. I have wished, for the most part, simply to put them on record as occurring in New South Wales. I will now add a few words on the differential diagnosis. Several conditions must be excluded before the diagnosis of acromegaly is admissable, the chief of which are myxœdema, osteitis deformans, chronic pulmonary osteo-arthropathy, and gigantism. Chronic pulmonary osteo-arthropathy is an even rarer disease than acromegaly. I know of only two instances in Australia—one published and described admirably by Dr. Springthorpe, of Melbourne; the other treated and, I think, shown at the New South Wales branch of the B.M.A. Association by my friend, Dr. Crago. I have arranged a table showing in a brief tabular form the chief points of difference between these diseases. Other ailments may have to be excluded, especially the rheumatoid affections. In these, marked pains in the joints, creakings, and other evidence of synovial trouble should count largely in favour of a rheumatoid disease.

In conclusion, I have to acknowledge that a survey of much of what has been written, and the study of my own cases, furnishes me with no good explanation of the true pathology of the disease. It is certainly a great step to know the association of gross lesions of or at the pituitary gland with the external signs of acromegaly. It is also certain that the eye symptoms of this disease are due to the pressure of the new encephalic growth; but my last case, and that described by Packard in the *American Journal of Medical Sciences*, June, 1892, shew that the brain lesion so commonly associated with acromegaly may exist, and yet the common signs of that disease be non-existent.* We are, therefore, not yet on firm ground as to the real cause of so profound an anomaly of nutrition. The pathology of acromegaly is far from being in the assured position that myxœdema has already reached. It is, indeed, scarcely as settled as that of Addison's disease, probably, however, it is largely in an analogous position, for not every lesion of adrenals produces the symptom group which Addison described, nor does every pituitary growth necessarily produce the signs of acromegaly. I am largely inclined to the view that gigantism, although it differs markedly from acromegaly, may ultimately be proved to be a disease akin to the latter malady, and with a somewhat similar pathology. It may be that different morbid processes, affecting more or less different functions of the gland, may cause on the one hand acromegaly, on the other gigantism, or may lastly produce symptoms, as in case V, which do not approach in their salient features either of the two types just mentioned. It is well to remember that instances of gigantism have occurred in which the signs of acromegaly have become superadded (Dana). The physiology of the ductless glands and of internal secretions has yet to be worked out. For treatment I would call attention to the fact that after a long and vigorous course of thyroid feeding one of my patients complains of less vomiting, less head pain, her nails are no longer striated, and she has almost lost the whole of the molluscal tumours, but she is weaker, her failing eyesight suggests further pressure, and her childish character is, if anything, more pronounced. Lately I have obtained pituitary extract (B. W. Co. Tabloids), but the time of administration is too short to speak of any effect: neither the pulse, respiration, or urine were apparently influenced by its use during her last stay in hospital.

---

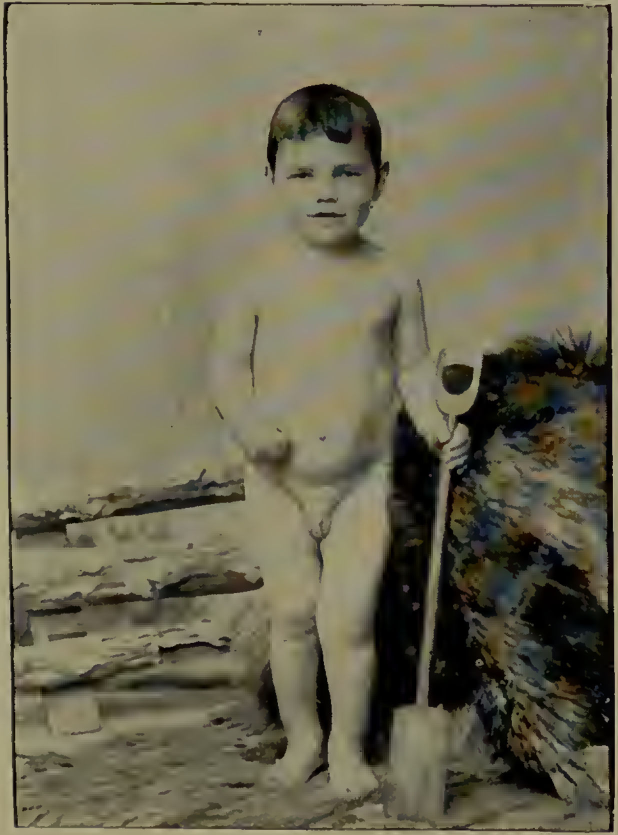
* Since the above cases were recorded I have met with another case of pituitary tumour unaccompanied by the common signs of acromegaly.

PROGRESS REPORT OF A MYXŒDEMATOUS SPORADIC CRETIN.

By J. Lockhart Gibson, M.D. Edin., M.R.C.S. Eng., Brisbane.

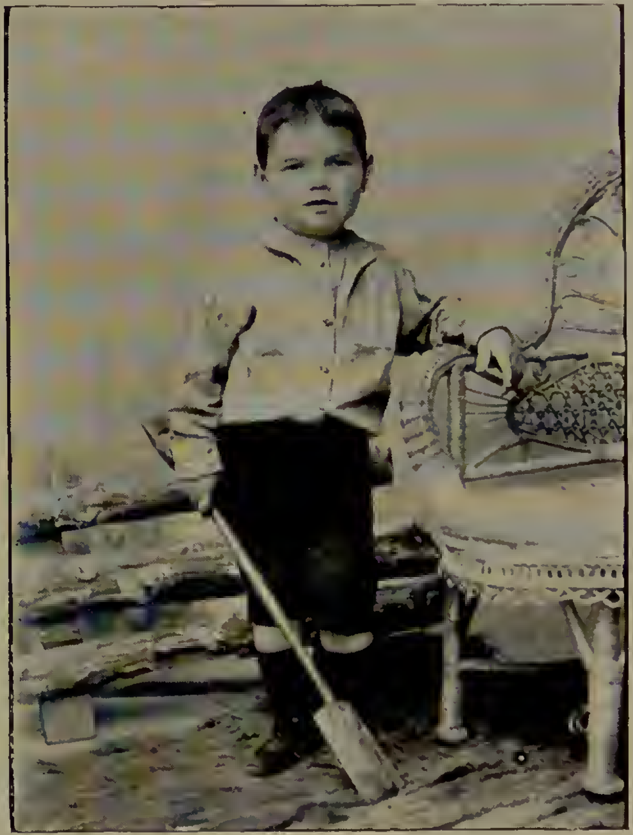
The photograph accompanying this paper will show for itself that since 1892 very considerable improvement has occurred. The former series of photographs published in the third Intercolonial Congress Transactions and in the *British Medical Journal* for 1893 showed the myxœdematous sporadic cretin first getting steadily more myxœdematous, and then, after thyroid grafting, steadily improving. The improvement continued for some months after the last photograph published, and then became stationary. It seemed probable that sufficient of the gland which had been grafted into the peritoneal cavity had not survived for the boy's needs. and that thyroid feeding would prove the truth or fallacy of this surmise. He was put, therefore, on thyroid tabloids (Burroughs' Welcome), and began to improve further. It has, however, never been possible to give him many tabloids, as an excessive dose at once induces marked irritability of temper and diarrhœa. He has been taking latterly one tabloid daily, and this is the largest daily dose he will bear. It seems likely, therefore, that at least some of the grafted gland survives, otherwise he would probably bear a larger dose by the mouth. He had before last report lost all signs of myxœdema, though remaining a cretin. He is steadily losing his cretinism, and is now a really intelligent-looking, sturdy little boy. His age is 10½ years, and he looks about 6 years, and is as firm on his legs as a boy of that age, and as muscular. It is quite evident, from the expression of his face when spoken to and from the fact that he readily does what he is told, that his intelligence is good. He can be sent to do anything or to deliver anything except a verbal message. He says "Yes" and "No" quite plainly and the names of some of the other children, and tries to answer and to say other words; but although the sound produced is something like, his pronunciation is very imperfect. I firmly believe, however, that he will e'er long speak intelligently and well, and am so satisfied with his very intelligent expression and behaviour that I now think it quite possible that he may develope into a useful member of society. His memory for places and people seems equal to that of an average child of six years. His height is now 3 feet 3 inches. At the end of 1892 it was just below 33 inches. I think of making a further endeavour to graft thyroid gland, as the outlook of thyroid feeding for the rest of his life is not a satisfactory one.

Two photographs accompany this. In one he is clothed, in the other naked. They should be specially compared with photograph No. 3 in the Transactions of the Third Intercolonial Congress.



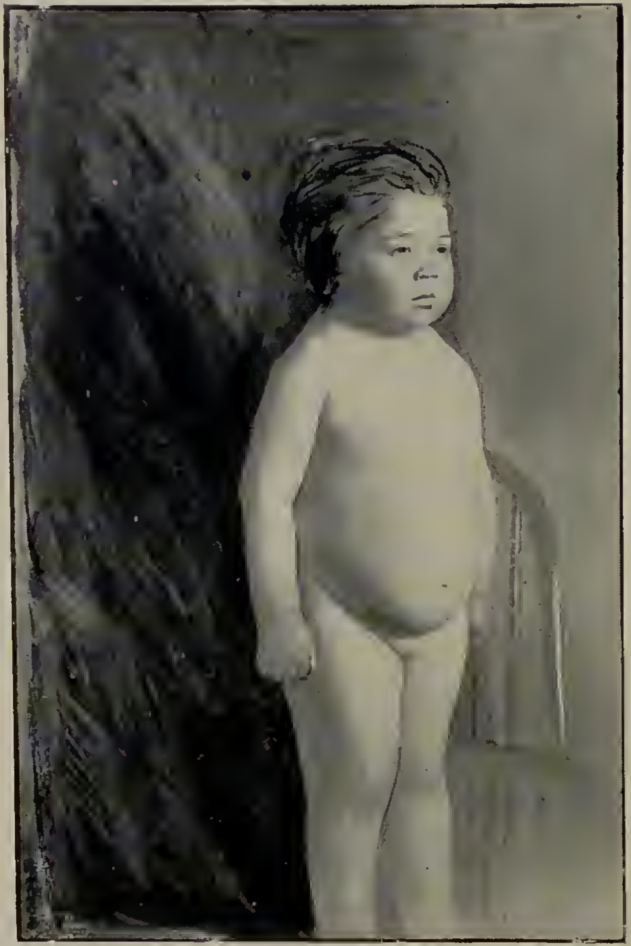
January, 1896.—Age, 10½ years; Height, 3 feet 3 inches. Compare specially with No. 3 in Transactions of Third Intercolonial Congress.

[The right hand moved.]

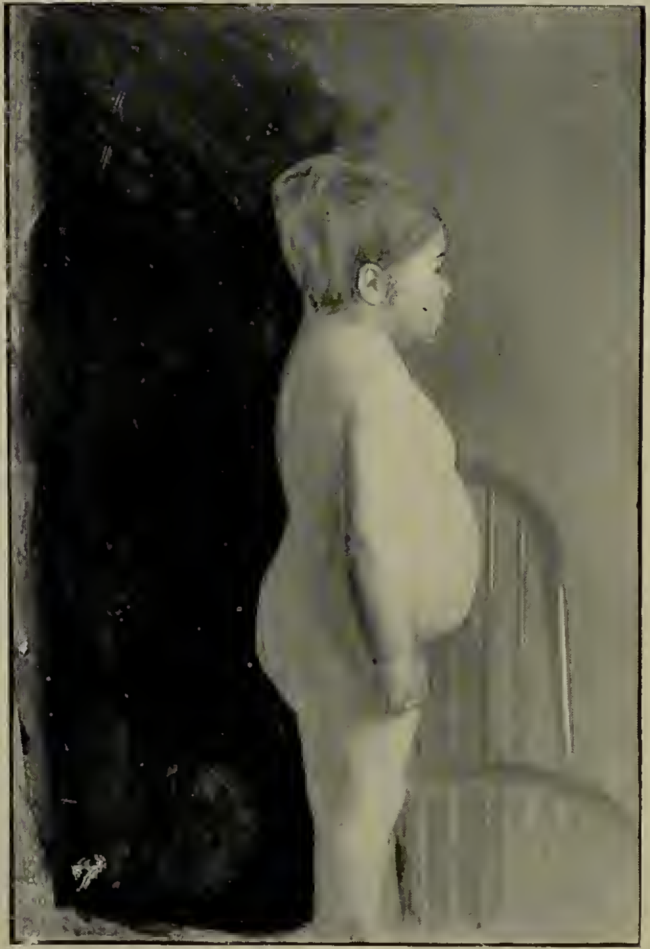


January, 1896.—Age, 10½ years; Height, 3 feet 3 inches. Compare specially with No. 3 in Transactions of Third Intercolonial Congress.

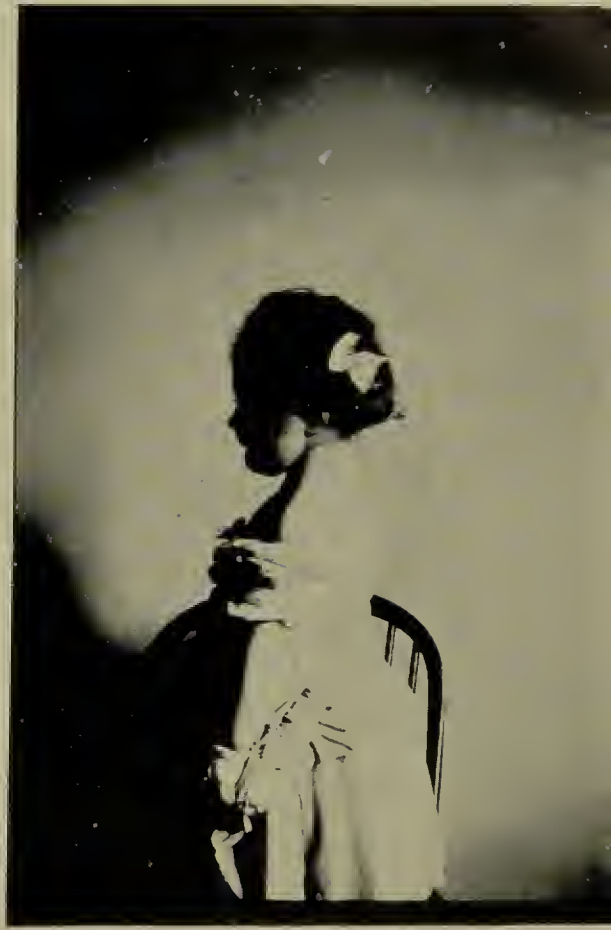
BURROUGHS, WELLCOME & Co.
LIBRARY
No.



No. 1.—January 16th, 1894; before treatment.



No. 2.—January 16th, 1894.

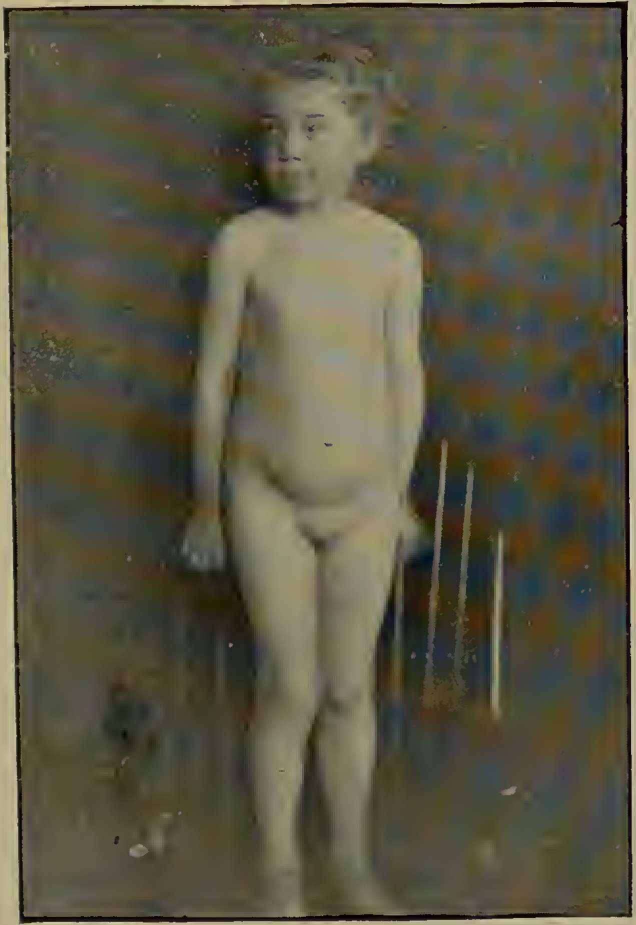


No. 3—February 23rd, 1894; to show cervical hump.

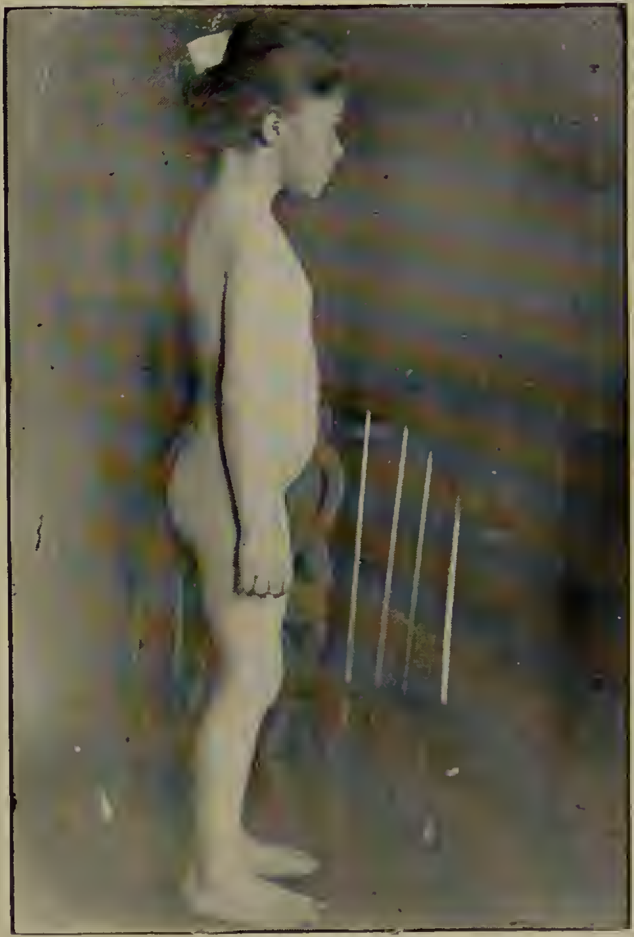
NOTES ON A CASE OF CRETINISM SUCCESSFULLY TREATED WITH THYROIDIN.

By C. Morton Anderson, M.R.C.S. Eng., Christchurch, New Zealand.

In the early part of 1893 I had read with much interest the accounts published in the English medical papers of several cases of cretinism which had been successfully treated by administration of the thyroid gland of the sheep, or of some of the many preparations which were being made from that gland. In the latter part of that year I had an opportunity, through the kindness of Dr. Ord and others, of seeing many of those patients whom I had previously been reading about, as well as several others, and of judging of the results for myself. I was very much impressed with what I saw, the change for the better in many of the patients being marvellous; but I do not remember seeing one, especially in so old a child, in which the result of treatment was more striking than in the case related in the following notes. The accompanying photographs, though very imperfect (being my first attempts at photography), will perhaps illustrate better than words the physical condition of the patient before and after treatment. 16th January, 1894—The patient, a girl aged 11 years, first showed symptoms of cretinism when about three years of age; she had been treated in various ways by other practitioners, but with no good result, and a year ago I had put her on a strict dietary for nearly three months, but with very little benefit. On 1st January she weighed 4 stone 7 lbs. in her ordinary clothes, and measured 3 feet 4½ inches in height, a gain of three-quarters of an inch during the previous year. This gain, though small, had been the greatest she had made for some years. Her features are thick and blunted, and she is decidedly pot-bellied. There are large supraclavicular folds of fat, and there is a large hump of the same material over the lower cervical and upper dorsal vertebræ. She feels like a dead weight when lifted, and cold to the touch, and the skin feels harsh and dry; her hair is long and thick, appetite poor, bowels fairly regular, and she sleeps well. The child's intelligence is decidedly dulled and slow; there is great want of animation; she drawls her words, and speaks slowly in a deep, peculiar voice; has been at school for a year and a-half, but can only spell a few monosyllables or add up three or four figures; circumference of chest, 24½ inches, and of abdomen, 27½ inches; pulse, 60; took photographs Nos. 1 and 2; ordered 2½ grains of thyroidin to be given every second day, which I increased to 5 grains on the 23rd. 2nd February—Temperature, 98·6; pulse, 78; much brighter and more animated; clavicular folds and cervical hump decidedly softer and rather smaller; digestive functions not the least disturbed; appetite improved; to take one 5-grain tablet daily. 23rd February—Weight, 4 stone 1 lb.; temperature, normal; pulse, 100; skin moist and supple; very much sharper, more animated and cheerful; getting quite tricksical and playful; abdomen not nearly so large; clavicular folds fast disappearing, but cervical hump looks quite as prominent; took a side-view photograph (No. 3) chiefly to show cervical hump; ordered one 5-grain tablet each morning, and half a tablet each afternoon. 14th March—Height, 3 feet 5 inches; weight, 3 stone 12½ lbs., being a gain of half an inch in height, and a loss of $8\frac{1}{2}$ lbs. in weight in two months. Child sometimes seems rather pale and weak; to take only 1 tablet daily. 21st March—Child seeming better; resumed taking $1\frac{1}{2}$ tablets daily. 20th April—Height, 3 feet 6 inches; weight, barely 3 stone 10 lbs. Clavicular folds quite disappeared, cervical hump almost gone, can feel the spines of the vertebræ easily through it. Abdomen nearly normal shape. Child quite bright, animated, and natural, but inclined to be thin. To take 1 tablet every second day. 11th August—Height, 3 feet $7\frac{1}{2}$ inches; weight, 3 stone 13 lbs., a gain of 3 inches in height a loss of 8 lbs. in weight in a little less than seven months. Temperature and pulse normal, skin fresh and healthy, appetite very good, bowels regular; never has bilious attacks now though formerly very subject to them. 15th November—Has grown $1\frac{1}{2}$ inches in last three months, and lost $\frac{1}{2}$ lb. in weight. General health splendid, skin and complexion quite natural; cervical hump has quite disappeared, the back in that region being like that of an ordinary child. For the last three weeks has only been taking $\frac{1}{2}$ tablet daily; reduced the dose to $\frac{1}{3}$ tablet. 1st March, 1895—Patient is in perfect health and good spirits, and quite as sharp and intelligent as any child of her age and education should be. Although I considered her cured I advised her to continue to take $\frac{1}{3}$ tablet daily so as to guard against the possibility of a relapse. She has gained about 3 lbs. in weight since November; height, 3 feet $10\frac{1}{2}$ inches. It will be noticed that in the thirteen and a-half months that have elapsed since the commencement of treatment the child has grown exactly 6 inches in height, besides which all symptoms of cretinism have completely disappeared. Took photographs Nos. 4 and 5. 24th August—Height, 3 feet $11\frac{3}{4}$ inches; weight, 4 stone $8\frac{1}{2}$ lbs.; still taking $\frac{1}{3}$ tablet daily. Patient in perfect health, attending school regularly; her schoolmistress has sent home a most excellent report for the term, both as to the child's progress and to her ability for learning. January, 1896—The improvement has been permanent, though the rate of growth has dropped to about $\frac{1}{4}$ inch per month, which I consider ample. She is taking $\frac{1}{4}$ tablet daily now, and often misses a dose. There is no history of any symptoms like cretinism to be obtained in either her father's or mother's families, nor can I get any history of goitre. Her mother has a cervical hump like the patient, though not so large in proportion, and there are no clavicular folds. She was not at all inclined to be stout till after her first three children were born, since which she has developed an enormous amount of adipose tissue, more especially from her waist downwards. I have tried dieting her carefully for some months, and afterwards treated her with thryoidin for four months, but the result has been nil so far as the obesity is concerned, and I found the drug had a rather depressing effect. I should mention also that both parents are particularly sharp, bright, and intelligent. There are five other children in the family, one older and four younger than the patient, all are bright, intelligent, and well grown for their ages, but all are inclined to be rather stout as young children, though not so when they grow older.



No. 4.—March 1st, 1895; after 13½ months treatment.



No. 5.—March 1st, 1895.

AN UNUSUAL CASE OF ACUTE LEAD-POISONING FROM TEA DRINKING.

By George Lane Mullins, M.A., M.D., Trin. Coll., Dublin.

Physician to the Hospice for the Dying, Sydney; President of the Eastern Suburbs Medical Association of Sydney; Late Assistant Physician to St. Vincent's Hospital, Sydney.

Mrs. R., residing at Randwick, a suburb of Sydney, purchased a packet of tea on the morning of the 10th July, 1895, for which she paid one shilling a pound. At dinner, in the middle of the day, she, her daughter, and her niece partook of some weak tea prepared from this. Shortly afterwards all three complained of dryness of the mouth and throat, and great thirst, which passed off during the afternoon.

Some of the contents of the same package were given to Mrs. W., a neighbour, who made a strong decoction, which she, her husband, mother-in-law, and son drank about 5.30 p.m. on the same day. About 6.15 to 6.30 they all complained of dryness of the mouth and throat, dizziness in the head, and loss of power in the lower limbs.

I saw the family about 10.30 p.m. Mrs. W., sen. (aged 86), complained of dizziness in the head, cramps in the legs and lower part of the abdomen, and coldness of the extremities. Was unable to swallow. She had not vomited. Was unable to pass any urine. Suffered from old-standing prolapse of the uterus.

Mrs. W., face flushed, anxious expression of countenance, shuffling gait, almost unable to walk, extremities cold, pupils widely dilated. Complained of thirst and dryness of the mouth and throat. Had vomited freely.

Mr. W. (husband of the last) had gone out of the house some time before my arrival, but had complained of dryness of the throat before leaving.

Mr. W., jun. (son of the last) complained of dizziness in the head and pain in eyes, with indistinctness of vision. Pupils widely dilated. Had vomited freely.

Miss W. (daughter), the only person in the house who had not drunk any of the tea, did not suffer at all. She had partaken of all the other articles of food on the table.

11th July, 11.30 a.m.—Mrs. W. and her husband are still unable to walk, though feeling better. Indistinctness of vision still strongly marked. Extremities cold. Ordered an ounce of castor oil to each, and also hot bottles to feet, &c. Mrs. W., sen., much improved; Mr. W., jun., quite well.

I procured some of the tea from the package and took it to Mr. Edmund Sager, the late Secretary of the Board of Health, for analysis. I advised the grocer from whom it had been purchased not to sell any more of the same parcel until the result of the analysis should be made known.

17th July.—Mr. Sager informed me by letter that the sample of tea had been analysed and found to be "contaminated with metallic lead, together with minute traces of manganese and zinc."

Remarks.—There can be little doubt that the symptoms presented by these persons were those of acute lead-poisoning; but how the metallic lead in the tea caused the symptoms in so short a time I am still unable to say. Whether there is any substance in the Sydney drinking water which, when heated, is capable of forming a soluble salt of lead, is a question I leave to be answered by those better versed in the mysteries of chemical science.

THE THERMAL SPRINGS OF NEW ZEALAND.

By T. Hope Lewis, M.R.C.S., L.S.A.,

Health Officer, Auckland, N.Z.

The Colony which has been selected as the home of the Congress for 1896 has been favoured by Nature in the matter of thermal springs in an abundant manner, and I feel sure it will be of interest to members to know something of the variety of the waters and their application.

Treatment by hot bathing has, I think, I may say, now taken its place as a therapeutic agent of great power. It certainly possesses the time test, for its records go back to the earliest periods of history, and curiously enough the imagination of coach drivers and some residents at our Spas is as vivid in regard to astounding cures as it was 2,000 years or more ago. Those of you who visit the Hot Lake District of our North Island will be regaled with accounts of cases and cures which have lost nothing by the frequency of being told and you may be apt to doubt the veracity of the *raconteur*. Nevertheless, the stories are founded on fact, and you must bear with the storyteller.

Thermal bathing has been rescued from empiricism and now stands on a more sure scientific basis than heretofore. Our recent knowledge of the vagaries of the uric acid diathesis, made especially apparent by the researches of Dr. Haig, have given me the clue to much that some years ago was a mystery to me in this particular connection. And these are the cases that one is most frequently called upon to treat by hot baths.

There are in the North Island of New Zealaud a very large number of thermal springs exhibiting varieties of composition and temperature, and situated in very different climates, and upon this point of climates I wish to speak as well as on the actual waters. Of course a very large number of springs are not used for bathing on account of difficulty of access, want of accommodation, &c., but several have been turned to use and rendered available for bathing and drinking purposes, and with these latter it is my intention to deal.

Starting from the north we have Ohocawai, the springs of which district are only used by the local people. Around the sandy edge of a spring in this district quicksilver has been obtained by simply dabbling with a spoon, no mercurial salt has, however, been detected in the mineral waters of the district. Waiwera, some thirty miles from Auckland, possesses a saline hot spring, the composition of which is very similar to that of sea water. The climate here is warm and mild, with excellent sea breezes.

Next we come to Okoroire on the line to Rotorua. Here there are two hot springs of quite dissimilar characters, one saline and one ferruginous. The climate at this place is bracing and clear, cool nights even in the hottest summer are the rule.

Then Te Aroha, which possesses the best water for drinking of any of the spas, a sodio-bicarbonated water similar to Vichy, an excellent antacid and diuretic. There are capital baths here, and it is largely resorted to. The climate again of Te Aroha differs from the two preceding spas, and the exercise of climbing a high mountain enters into the treatment of some cases at this township. The food also here is of excellent character, and Te Aroha is adapted for the treatment of many cases that do not do well at other spas.

Rotorua, and with it Whakarewarewa, the twin spas, come next as we go southwards. These two are the best known thermal resorts we possess, and Nature has been extremely liberal with the variety of waters in this locality. Acidic. alkaline, siliceous, saline, and hepatic waters abound here at all temperatures. The Government of this Colony has established a sanatorium at Rotorua, where cases are taken as in-patients, and there is a medical officer in charge of the hospital. A large section of the public is under the impression that, as this part of the Colony is called the Hot Lake District, it is a warm climate all the year round. This is not so. In winter it is particularly bleak and cold. Hard frosts, and late ones too, enough to nip the early potatoes in October and November occur often. There is but little growth in the grass until November in this district, and for many patients it is far too cold a place to go to until December. The climate in the North Island is an extremely variable one, and springtime is often late and sometimes early. Excellent bathing accommodation has been erected at Rotorua by Government and by private enterprise, and by far the largest number of patients frequent this locality.

About eleven miles from Rotorua township are situated the springs of Tikitere, the "Inferno" of the district. Ghastly-looking mud holes and black acidic boiling pools abound here. Though the accommodatian is extremely poor — only a Maori raupo whare or native house slightly Europeanised by wooden bunks—a large number of patients visit these springs every year, and some excellent cures of really chronic rheumatic ailments are chronicled. The waters are powerful and hot, and the use of mud baths at this spot, coupled with the entire removal from civilisation surroundings, may have something to do with the results. There is no over-feeding nor alcohol at Tikitere, and every inducement to get well as fast as you can.

As we go further south so does the warm water appear to increase in volume, and at Wairakei and Taupo there are absolutely rivers of warm water. Being further from the centres of civilisation, both these places are not as well known nor as much frequented as Te Aroha and Rotorua; but the waters are of excellent character and supplied in abundance. The climate is the finest of any yet mentioned. We are now close to 2,000 feet above sea-level, and in the heart of the thermal country, near the lofty peaks of Ruapehu and Tongariro. A more bracing summer climate could not be found—clear, cool air, warm sun, an ideal chest country, very sparsely populated.

Hanmer Plains, in the South Island.—The hot springs situated at Hanmer Plains, some 93 miles from Christchurch, are the only thermal waters that have been used for public baths in the South Island, and are each season becoming better known and appreciated. They are reached in one day from Christchurch. There are a number of springs, varying in temperature from 90 to 120 degrees Fahr. They are especially valuable in rheumatic, skin, and nervous complaints. There are four luxurious baths, supplied with hot and cold water, which have been erected by Government; and there is also a large swimming bath, with commodious dressing rooms, &c. The climate is bracing, the air being beautifully clear and invigorating, and the altitude of the locality is 1,200 feet above sea-level.

These are the best known of our thermal sanatoria, but there are many others still infants in spa life, which some day will be able to boast of grand hotels, &c.

It will be seen that with this diversity of waters and localities that a medical man has a large field to pick from in advising a certain spa for a specific case. The treatment at the various spas consists in simple immersion at most, in some immersion and subsequent hot packing, in some hot douches descending, in others sulphur vapour baths, and in drinking the waters at almost all. A very large number of invalids treat themselves to a course of baths according to their own idea of their case, and a good many make themselves much worse thereby, the usual mistake being over-heroic treatment, such as three or four baths a day as hot as can be borne.

The diseases benefited by the hot baths are gout and rheumatism in all forms; the uric acid diathesis in all its phases. Certain forms of paralysis, notably those cases caused by cold and those caused by diphtheria, and the various neuralgias do well. Skin affections, such as parasitic forms, eczema, and, curiously enough, psoriasis, are benefited. Some cures of this latter complaint have been a most interesting study. Dyspepsia in some forms does well—probably the uratic type. Convalescence from acute diseases, especially when delayed, is much aided by residence at some spas, where the treatment is carefully carried out. A very large number of cases of sciatica of both the rheumatic, gouty, and the neuralgic varieties (if one dare differentiate) come up for treatment at the spas. Needless to say, they have had all sorts of treatment at home before coming. These cases do well at most spas, and though many do not lose the pain while undergoing the treatment, they become perfectly cured within a month of leaving the thermal district. This is a particularly interesting fact, and points to a peculiarity in the uratic diathesis that tissue metabolism undergoes waves of intensity after a particular habit of body has been acquired for a certain time, and that habit is subsequently changed. This may occur in all individuals, but I think is more marked in the uratic than in any other diatheses.

Some of these spas offer a change of climate from our coast towns which is of great value in certain cases, apart from the thermal water treatment, and doubtless will be more used as places of change bye and bye. I am continually being consulted by patients as to the advisability of a course of baths for ailments which are totally unsuited for treatment by hot bathing, more especially cases of phthisis, chronic bronchitis, asthma, spinal curvature, Potts,' and tubercular troubles. Hot bathing is bad in every shape and form for phthisical cases, and many have been made seriously ill by taking the baths. Hæmoptysis has been induced in several to my knowledge.

Locomotor ataxia is another complaint that seems to be ill suited for treatment by the hot springs, cases usually becoming weaker thereby. As an aid in the treatment of syphilis in its tertiary forms, I have had the happiest results at certain springs by combining bathing with inunction, after the plan of the late Mr. Berkeley Hill; the fine bracing atmosphere of the high altitude spas no doubt helping materially in these cases. When it is remembered that our large centres of population are situated on our coast line it will be at once seen that the natural change is an inland sanatorium, and that, if possible, at a good elevation.

Entirely unsuited to acute complaints, there are few chronic diseases in which mineral waters cannot be used with advantage. When thermal treatment is applied in a suitable and methodical manner the following effects are observed: Appetite is developed. digestion is effected with greatest ease, the skin performs its functions with greater activity, the blood circulates more freely, the glandular secretions are stimulated, the temperature of the body is raised, and the strength is augmented. While, when the treatment is not carried out properly and judiciously, all these health-giving processes are reversed, and languor, lassitude, and enervation take their place. It must be borne in mind while discussing this subject that, as a rule, it is only those cases which cannot be benefited by treatment at home, and which have had the round of the pharmacopœia that come up for the baths, and so chronic cases are those that one sees in this connection. It is stated that 75 per cent of cases sent to one spa (Rotorua) are either rheumatic or skin affections, and of these I should say 70 per cent. are rheumatic. It is by the successful results in rheumatic cases that thermal spas have made their name as curative agencies, and the benefit in these cases has been gained by the excretory power of the skin, stimulated by thermal bathing, and the excretory power of the kidneys, stimulated by the internal administration of certain hot waters. The beneficial action of the water in eczema of a gouty character is explained in the same way, also in many other minor ailments which owe their origin to uricacidæmia.

The continual maceration of the cuticule seems to be the beneficial agent in cases of psoriasis, and the acidic sulphurous waters seem sufficient parasiticides for pityriasis, versicolor, and impetigo.

Cases of delayed convalescence receive a fillip from the stimulating effects of judicious hot bathing, with change of air and scene, which tonics of sorts do not seem capable of producing at the patient's home. And these last cases are the ones most suitable for sending to the various spas for treatment. Medical treatment generally has become so much more thorough now-a-days during acute attacks that delayed convalescence is rarer than it was.

Turkish and Russian baths, Massage and electricity, have been added to therapeutics on a sound basis, and many cases that would otherwise have to go to a thermal spa, are cured by one or other of these agencies Still there will probably always be a large number that will be more quickly, safely, and pleasantly cured by a visit to a spa suitable to the particular ailment.

The variety of climates exhibited by the spas must be borne in mind when advising a course of baths. We have only one coastal spa, Waiwera, the springs of which are on the beach at that place. The remainder are inland, and have generally bracing and invigorating climates of varying degree. The bright, clear atmosphere of Okoroire is in marked contrast with the sulphur laden air of Rotorua and Whakarewarewa, and the exhilarating climates of Wairakei and Taupo differ markedly from the enervating and warm character of Waiwera. Each climate has its uses in the treatment of our patients whose diatheses differ as much as do our springs.

THE PHILOSOPHY OF DISEASE: A STUDY IN PATHOGENESIS.

By Dr. M. Lomax Smith, Christchurch.

Many of those, I fear, whom I have the honour of addressing may regard the subject with which I am about to occupy their attention as a sheer waste of time. Yet a little consideration should dispose of this objection; for surely it can never be too late in the day to refer to first principles. No science, and especially no inexact science like medicine, can afford to divorce itself from the study of origins. The words are as true now as when they were written by the great philosopher-poet 2000 years ago:

> Felix qui potuit rerum cognoscere causas,

and the science of medicine has languished too long under the stigma of empiricism, and has waged too deadly a conflict with the forces of chalatanry, superstition, and imposture to resent any philosophical inquiry into the essential nature of disease. With diseases, so called, we are familiar enough—we are called upon to treat them every day; but disease itself—that which constitutes the morbid process, the constant pathological factor in the phenomenon of ill-health—this, I think, occupies our attention too little. So, trusting to your forbearance, I will not be afraid of the task I have set myself, but will attempt, by a brief study of pathogenesis, to throw a little light upon the philosophy of disease Much of the light I can throw will, I am afraid, be only upon our ignorance. Yet this should not deter us, for surely he only can be called wise who best knows his own ignorance. Apt as we are at the present day to plume ourselves upon what we know, we are apter still to include in the term what we only half know, and often what we do not know at all. And in the realm of disease how little it is that we really know. We have been told, for instance (editor's preface to Fagge's

"Principles of Medicine"), that there is no such thing at all as disease, apart from what are called diseases; "that no line can be drawn between health and disease; that pathology is only physiology under various disturbing causes." Hence, we are assured, all "systems of medicine," like all "universal remedies," are of necessity false, "not wrong solutions of a scientific problem, but ignorant answers to an absurd question." Now that is a distinct statement enough, but is it true? If so, it of necessity follows that just so far as there is no such thing as disease there is no such thing as health, but only states of more or less physiological wellbeing. Yet all of us can form a distinct mental picture of health—a state in which all the vital functions are performed easily, painlessly, and unconsciously—and most of us, I hope, at one period or other of our lives, have, as we say, "enjoyed" such a state. "That long disease, my life," of which Pope so pathetically speaks, is, I trust, an experience, at all events in these colonies, comparatively rare. It is difficult, indeed, to conceive of health as other than a positive state, or how else could disease be said to be a deviation from it? For what is it that is diseased, unless it be an organism previously healthy? And what sort of deviation can that be called which has no normal standard from which it deviates? True, this deviation may assume different forms and have varying degrees of intensity, as more or less vital functions and organs of the body are involved; but so long as the organism is one and interdependent, so long will it remain true that "when one member suffers all the other members suffer "with it"—that is to say, that the standard of health for the whole body is simultaneously lowered.

What, then, is this deviation from the normal physiological standard which constitutes disease? One thing is obvious upon the face of it, and that is that disease applies to an organism and not to an environment. What, again, is an organism? An organism may be roughly defined as the sum total of certain forces in vital correspondence with their environment; just as, in Herbert Spencer's definition, life itself is said to be the continuous adjustment between internal and external forces. Now, this continuous adjustment between the forces inherent in an organism, and those supplied by the environment is approximately constant in healthy states of the organism—*i.e.*, it can only vary in health between certain well-defined limits peculiar to each individual. Beyond these limits any variation is the expression of ill-health or disease. Disease, then, of any living structure may be defined as that state which supervenes when the necessary adjustment between the organism, or any part of it, and its environment is interfered with. That is, it is an effect produced in the organism by some disturbance of its environment, a disturbance to which the organism was naturally, or by acquired habit, susceptible. It appears, then, contrary to the contention of the author quoted above, that disease itself, apart from its specific manifestations, is a real pathological condition, the particular expression of which may be determined by the environment, but which in its essential nature is independent of it. This may appear a bold statement, but I hope to justify it as I proceed. It is necessary, however, to fully meet the requirements of this definition, that we enlarge considerably our views of environment. By environment we usually mean physical or material environment, and such, no doubt, in the case of a perfectly simple organism like the amœba, would be all that the term need embrace. But in the case of such a highly complex organism as man, it is obvious that the meaning of environment must be very largely extended, that it must be extended, in fact, to all those mental and moral, as well as material, correspondences which make up the sum of human life.

In corroboration of this extended view. let me quote you a few sentences from an address lately delivered by Dr. Gowers, at Manchester, on the "Dynamics of Life." In this address, singular for the profundity of its thought and the poverty and infelicity of its language, Dr. Gowers says: "Disease belongs to life as health does. We pass from one to the other in knowledge as in experience. But in our thoughts of abnormal action we are often thrown back upon our conception of normal action; we are thus made to endeavour more earnestly to perceive that which underlies both, because in the one we have more need than the other." Further on he says, speaking of the phenomena of an epileptic fit, that these "bring before us, in an effective way, the limitation of our efforts in the presence of life, and also the way in which disease as such, in its essential nature, is distinct from the process of its manifestation. Many phenomena of disease take us directly to the mysterious relations of energy to life, which underlie all we observe, and are in this nature beyond our direct scrutiny. They raise at once the problem of their nature. We cannot contemplate such disorders as epilepsy without being compelled to wonder what is their actual nature, and how their manifestations are produced. And we cannot do so apart from the consideration of similar processes in health. Their reflective light make some features of normal life more conspicuously important, and compels their closer study."

Here you have a special form of disease spoken of as something which, in its essential nature, is closely allied to "those mysterious relations of energy to life which underlies all we observe;" something, that is, which is apparently intra-organic instead of extra-organic in origin, and which seems to be produced, as Dr. Gowers goes on to observe, by a fundamental instability of molecular equilibrium between those forces, chemical, physical, electrical, and vital, which form the sum total of individual organic life.

Before going further into this question and the profoundly interesting problems which it opens up, I should like to set alongside this quotation one from Ziegler's "Textbook of Pathological Anatomy and Pathogenesis," which approaches the subject from the opposite point of view. Professor Ziegler says: "A true disease is not a consequence of the indwelling or inherited properties of the cell. The efficient causes of a disease are always external. In the observations we made on the amœba it was heat or cold, an altered surrounding medium, or the galvanic current, which brought about disease and death. All these noxious influences are derived from without, and what we have remarked in a single instance experience shows us to be universal. Autonomous as the cell may seem, it is yet unable, without external impulsion, to heighten its functions above the physiological standard, or, on the other hand, to check or suppress them. [It is difficult, on this hypothesis, to see how the Professor accounts for an epileptic fit.—M.L.S.] We can, therefore, give a still more exact definition of disease. By the term disease we are to understand a deviation of some of the vital manifestations of an organism from the normal, the deviation being conditioned by external influences." Of course the whole value of this definition will depend upon the precise meaning attached to the term "normal physiological standard." It is a well-known fact that in moments of intense mental or emotional excitement we are capable of feats of strength which are far above the normal physiological standard of our neuro-muscular activities. Dees it follow that our nervous and muscular systems are at these times actually diseased? Again, in the cataleptic stage of natural or induced somnambulism, not only our nerves and muscles, but our organs of special sense, are capable of an exaltation of function far removed from that of our waking state. Yet we know this deviation from the normal, if not pushed to excess, is compatible with perfect health. The same is true of the operations of the mind. Brains soar every day far above the normal intellectual level of average humanity, and though, as Dryden has it,

> Great wits to madness sure are near allied,
> And thin partitions do their bounds divide,

we do not on that account treat the "thin partitions" as non-existent, and incarcerate our Shakespeares, Newtons, and Edisons in lunatic asylums. The plain truth of the matter is that we know very little about the "normal physiological standard" of any tissues or organs, except those appertaining to the simplest life-forms And we never seem to make allowances for those "mysterious relations of energy to life which underlie all we observe."

Without pursuing the subject further at present, I may observe that in the two statements quoted above are summed up the only two possible theories which can be held regarding the nature of disease. Conflicting as they appear to be, a closer investigation will show that they conflict more in appearance than reality. For it is obvious that the causation of disease can always be approached from without or from within, from the side of external attack, or internal vulnerability. Let us take a concrete example. The disease called typhoid fever is known to depend upon the presence in the body of a micro-organism having a special affinity for the large mucous glands of the small intestine. Under certain circumstances, of which we are ignorant, these glands lose their normal power of self-protection, and permit themselves to be invaded by the typhoid bacilli which are present, we will assume, in some infected drinking water, which has been taken into the system. The result is the specific disturbance known as typhoid fever, the cause of which might with equal propriety be ascribed to the presence of the typhoid bacilli, or to the fact that there was a special affinity between these bacilli and a particular part of the human intestine, an affinity which the resisting forces of the organism were at the time powerless to counteract. Obviously, however, there might be whole colonies of typhoid bacilli in the water we drink which, except for our unfortunate susceptibility to their attacks, would be perfectly innocuous to us—as innocuous, for example, as they apparently are to sheep and pigs. Remove that susceptibility, and typhoid fever, so far as the human subject was concerned, would cease to exist. *Cessante causa, cessat affectus.* In other words, establish immunity, and you will abolish disease. Take again the disease known as anthrax. Investigation has proved this fatal affection to depend objectively upon the presence of the anthrax bacillus, which in susceptible animals, produces the deadly splenic fever. But the odd thing is that certain animals—fowls, for instance—are absolutely insusceptible to anthrax. The cause of this immunity among fowls was discovered by Pasteur. He found that the anthrax bacillus does not develop when subjected to a temperature much over 40° c. The body temperature of a fowl is about 41° c., whilst that of the dog and rabbit are about 38°–39° c. But by reducing the body heat of a fowl to 37° c., it was found to be intensely susceptible to the virus of anthrax. In the same way a frog has too low a body temperature to be affected by the injection of anthrax cultures, but by raising its body heat artificially to 36° c., such injections prove rapidly fatal. (Bland Sutton; "Evolution and Disease, p. 253.) Now, in both these cases it might be said with truth that the cause of the splenic fever depended as much upon the body heat of the animal as upon the anthrax bacillus. Similarly, tuberculosis, that disease of almost world-wide zoological distribution, which is dependent in one sense upon the tubercle bacillus, is dependent in another and equally true sense upon a body temperature of from 37° to 39° c. (98·4 to 102·6 F.), which explains the comparative immunity of cold-blooded animals as regards tubercular disease. Thus, could the normal temperature of the human species be reduced permanently by so little as one degree Fahrenheit, it is probable that the deadly scourge of consumption would in time be absolutely eliminated. And this notwithstanding the fact that tube cle bacilli swarmed in countless millions in the air we breathed. Since, however, science knows of no method by which this feat could be accomplished, it seems wiser in our present state of knowledge to turn our attention to the bacilli, which, unfortunately—like the poor—we have always with us.

Here, then, it may not be out of place if I make a few remarks upon the treatment of disease. It is obvious that just as disease may have a subjective as well as an objective origin, so it may be treated by a subjective as well as objective method of cure. That is to say, you may attempt to establish immunity in one or two ways—either by increasing the resisting forces of the organism, or by counteracting the hostile forces of the environment. The one method might be called establishing a natural, the other, an artificial immunity. The one seeks to render the organism invulnerable, the other to disarm its assailants. Now, though the more natural and philosophical method would doubtless be to render the organism invulnerable, we find, unfortunately, in practice that this is rarely possible. It follows, then, that our chief efforts, as physicians, must be directed towards establishing what I have called an artificial immunity. How successful this method has been in surgery we are all aware. I refer, of course, to what is known as the antiseptic treatment. That this is an eminently scientific method results have abundantly proved; moreover, it is the only method available in surgical cases. It is obvious that in a patient exhausted by hemorrhage, or the shock of a serious accident or prolonged operation, no better means of ensuring recovery can be made use of than by rendering innocuous the attacks of those bacterial enemies that do so easily beset us; and the same is in many cases true of the treatment of disease. Where such disease is known to depend upon bacterial agency—*i.e.*, upon a virus communicated from without—all such measures, therapeutical or otherwise, which tend to limit the effects of the poison and counteract its influence in the system, are most urgently indicated; provided, of course, that the remedy does not at the same time lower the natural resisting forces of the organism. For we ought always to be most carefully on our guard that in our treatment of disease we are treating causes and not effects—*i.e.*, that we are helping forward a natural cure, instead of checking this in favour of an artificial one. Not, I repeat, that we should neglect any means, artificial or otherwise, of eradicating disease. In our present state of knowledge it is not only scientific, but our bounden duty, to attack disease from as many sides as possible, whether of the organism or the environment. But while doing this it behoves us to remember that disease is not the simple thing we are sometimes disposed to imagine it, but that included among its phenomena, and appearing to partake of its nature, are symptoms which are aften remedial and salutary. Thus, I think it will be generally admitted that the rise of temperature in febrile diseases, local and general, is not only the result of the absorption and development of a septic poison, but also an exact indication of the efforts which Nature is making to get rid of it. That is to say, the fever is not itself the disease, nor to be treated as such, but is rather the result of the deadly and internecine conflict which is being waged in the body by the vital forces of the organism, and their hereditary foes, the bacteria; provided, of course, that the disease is bacterial in origin (many diseases are not; and of these, the degenerations as a class may be taken as types. In these cases fever is not a usual nor a prominent symptom, while, as if to puzzle us, *vis medicatrix naturæ* seems rather to expend its energies upon tissues of a humble type, leading to those connective-tissue scleroses by which the cells of the parenchyma, the functional elements of the organ, are ultimately destroyed. Indeed, it seems as if repair could only follow the lines of evolutional development, beginning with the humbler histological elements, and not seldom sacrificing the higher to them. Many of the higher elements, such as the grey matter of the brain and spinal cord and the axis-cylinders of nerves, when once lost are never restored).

But my object in this paper is not so much the treatment of disease (this has been mentioned merely incidentally), but the discovery, if possible, of its cause. The cause, we have seen, like the cure, may be described as twofold—*i.e.*, as existing in the hostility of the environment and the susceptibility of the organism. It is obvious that these two conditions must coexist, for if we abolish one or the other, disease would be equally impossible. Of the two conditions, the question of susceptibility has more interest for the philosopher, the question of external agency for the scientist; for the scientist looks down on the philosopher, and always plumes himself on being by far the more practical man. None the less it is of supreme interest for us to enquire upon what conditions susceptibility, or, in other words, immunity, depends, for the ground is one upon which both scientist and philosopher can meet. The subject of immunity was treated at some length in a very interesting paper read by the president of the last New Zealand Medical Congress, Dr. Jennings. The particular lines occupied by this paper—viz., the various artificial methods made use of in establishing immunity—I do not intend to do more than touch upon. For one thing, there is not a point in the discussion which is not hotly debated by the advocates of rival theories; for another, the discussion seems hardly to have approached as yet the all-important question of the difference between natural and acquired immunity. That there is a very great difference seems beyond a doubt, yet it is not at all easy to define or separate the two terms. For all we know, the immunity of vaccinated and unvaccinated animals may depend ultimately upon the same vital cause. How do we know, for instance, that the difference between the anti-toxic and bactericidal properties of the blood, both in naturally and artificially immune animals, may not be due to varying states of the nervous system or differences of molecular equilibrium in the ultimate elements of the nerve-cells? As you are doubtless aware, the peculiar virus of micro-organisms is obtained from their toxines. These are secreted at varying intervals after the invasion of the system by the bacteria. The length of the interval depends upon the character of the micro-organism. There are, then, two methods of producing immunity. One is by destroying the bacteria before they have time to secrete their toxines; the other, which is called the anti-toxic method, is by providing an antidote to the toxines themselves. In cases of natural immunity it is probable that the first condition is established, and that the bacteria are never allowed to secrete their toxines at all. It was on observations drawn from this fact that Metschnikoff founded his celebrated theory of phagocytosis. Into the details of this theory, which are doubtless familiar enough to my hearers, I have not time to enter. It suffices to say that there are many difficulties which it does not attempt to solve. Take a single instance. It appears that should the toxines have been allowed to form, the disease must take its course. That they have the power of neutralising the action of the phagocytes, even for some considerable time after recovery, would seem to be proved by the fact, which is given on Metschnikoff's authority, that while the serum of a healthy man destroys typhoid bacilli, they flourish unchecked in the blood of one recently recovered from the disease. Yet how, in this case, can the protective action of a previous attack of a specific disease be accounted for? But without lingering further upon the differences of learned opinion as to the cause of immunity, I would like to ask a few simple questions. To begin with, if by "natural immunity" physiologists mean immunity to artificially-induced disease, how do they justify the term? Because an animal, or a man, is immune to the injection of artificial tetanus cultures, does it always follow that they are unable to contract the disease in the ordinary way? Is the hypodermic injection of an artificially-prepared virus the same thing as its introduction into the system *per vias naturales*—*i.e.*, the lungs and digestive tract, and *vice versâ*? On the contrary, is it not known that the whole digestive tract is lined with bactericidal police-cells (perhaps I should say cellular police) and protective ferments, which are absent from the blood. Then, again, can it be said that the conditions under which "control" animals are kept are, in any sense of the word, "natural," or tend to produce "natural" results? We all know how great is the influence of fear as predisposing to susceptibility in human beings: may not the same be true with regard to the lower animals? Here is an unfortunate guinea-pig, for instance, with all its faculties sharpened by enforced domestication, with its sympathies and instincts acutely alive, kept for weeks in a hutch with others of its kind, all intended for a common doom, and often within sight of similar victims already inoculated. I only describe what I have seen many times in England and abroad. What do we know of the "natural immunity" or otherwise of an animal so situated? May not a guinea-pig, like a human being, be immune to-day and susceptible to-morrow according to the state of its health or the fertility of its imagination? To my mind, the whole question of immunity is complicated enough in the human subject without adding to its complexity the conflicting results of vivisectional experiment. So far as my own reading has gone, it seems to me that this method of research, instead of solving old difficulties, has only added new. I am not raising here the question as between vivisectionists and their opponents, but I may say this: that the longer I live and the more I reflect upon the matter the more convinced I am that, whatever may have been the intentions of the Deity in creating the animal kingdom, he never meant it as a convenient laboratory for the manufacture of attenuated virus. And the seemingly hopeless disagreement of bacteriologists as to the causes of immunity only confirms me in my conviction. What has it all come to so far? After repeated and laborious experiment Metschnikoff himself insists upon the deduction that "immunity in infectious diseases is due to the activity of the living cells in the organism." (Quoted in the Proceedings of the International Congress at Budapest, 1894.) And in the forefront of his three categories, demanded by the theory of phagocytosis, he refers immunity "to the innate resistance of the cells to the toxines." Surely it did not require whole hecatombs of poisoned and tortured rabbits and guinea-pigs to prove that. When we come to think of it, what else at bottom could immunity be due to? All observers agree that for any kind of bacteria to find a lodgment in the system there must be a lowered tissue-resistance and defective vitality, either general or local. But, I would ask, what is this "innate resistance," this "living activity" of the cells of an organism, but the expression of that positive condition to which I referred at the outset of this paper as the condition of health. Surely this incursion we have made into the realm of bacteriological therapeutics has but confirmed my statement that health is not merely the absence of disease, but a very positive if mysterious agency by which disease is constantly kept at bay. I shall be told, of course, that the question we are discussing is not only the prevention of possible but the treatment of existing disease, and that when disease is present it is very little use talking about health. What are then needed, it will be urged, are not preventives but antidotes. Yet surely it is but reasonable to suppose that a preventive may be after all the best antidote, that those natural conditions which repel disease may be the most favourable conditions for curing it. A city is not necessarily captured when the first breach is made in its walls. There is the street-to-street fighting still to be reckoned with. It is too much the fashion now-a-days for the physician to think that a knowledge of the laws of disease implies a corresponding knowledge of the laws of health. "Perhaps the most curious thing about our modern conceptions of health," says Edward Carpenter, "is that it is purely a negative one. So impressed are we by the myriad presence of disease—so numerous its dangers, so sudden and unforetellable its attacks—that we have come to look upon health as a mere absence of these. As a solitary spy picks his way through a hostile camp at night—sees the enemy sitting round his fires, and trembles at the crackling of a twig beneath his feet—so the traveller through this world, comforter in one hand and physic bottle in the other, must pick his way, fearful lest at any time he disturb the sleeping legions of death; thrice blessed if by any means, steering now to the right and now to the left, and thinking only of his personal safety, he pass by without discovery to the other side. . . . Health with us is a negative thing. It is a neutralising of opposing dangers. It is to be neither rheumatic nor gouty, consumptive nor bilious; to be untroubled by head-ache, back-ache, heart-ache, or any of the thousand natural shocks that flesh is heir to! These are the realities. Health is the mere negation of them." Now, although this is only a layman's irony, there is a good deal of truth in it. Nor is it much to be wondered at. Occupied with the treatment of disease every day of our lives, no wonder that we ignore sometimes the very positive qualities of health. Yet the very etymology of the word should serve to remind us of the fact. The words health, whole, holy, are all from the same stock, a root meaning "unity" or "wholeness." Unity of what? Of use, or function? That is impossible. What is meant is unity of organisation or co-operation, a harmony of the entire forces—physical, mental, and emotional—which form the sum total of individual life. There is also implied, as in all co-operation, subordination of the lower to the higher forces. Other relatives or congeners of the word "health" may be noted. Such are: heal, hallow, hale, wholesome; the German *heilig*, *Heiland*; the Latin *salus*; the Greek καλος. Also compare Hail! (the salutation); and, less certainly connected, the root *hal*, to breathe; French, *hakine*; Italian and French, *atme* and *âme*; also Sankscrit, *atman*; German, *athmen* (meaning the soul).

I am aware how unimportant questions of etymology are from the standpoint of medical science. Yet it is possible to learn a good deal from quite unexpected sources. Medical science especially is not in a position to disdain help from any quarter. No doubt this is pre-eminently a scientific age, yet is it not a painful satire upon our science that all our discoveries seem but to bring to light fresh diseases, and all our knowledge seem but to give them wonderful and strange-sounding names? I hope I shall not be misunderstood. No one has a greater respect and reverence than I have for those noble workers and discoverers who have added so much to our stores of knowledge, and who have devoted long and laborious lives to the amelioration of human suffering and the cure and prevention of disease. But is it not possible that we have been so busy finding out the causes of disease, that we have overlooked the causes of health; that while our knowledge of the one has vastly increased, our knowledge of the other is as vague and empirical as ever? That we shall in our day discover the ultimate causes of health is no doubt improbable—as improbable as that we shall solve the ever-deepening problem of life. In one sense the two problems are the same, for health obviously depends upon vitality, and vitality is one of the manifestations of life. Yet life, and health, and vitality are facts—not figments of our imagination—and as such they must have a cause. Of their mysterious yet all-potent agency, not only in the prevention, but in the cure of disease, we have proofs every day. The time has definitely gone by when we could ignore the influence of the mind upon the body. The extraordinary recuperative power which certain exalted mental states undoubtedly exert over depraved physical conditions: the immense field which has been opened out by the modern science of what is called by Siebault "suggestive therapeutics" (modern we call it, yet in reality how absurdly ancient); the marvellous phenomena of the therapeutic hypnotism; the vast and ever-increasing number of faith cures, mind cures, will cures, which, explain them how we will, are one of the most striking features of this closing nineteenth century, as they were one of the most striking features of the first: the marvels of Lourdes, St. Winifred's Well, and of that strange development of mediæval mysticism calling itself Christian science: here is a hundred other facts, which however we may choose to disbelieve them, are as well attested as any facts of history, and are occurring every day in our midst, all pointing to the unsuspected existence in us of faculties and powers, whether physical or psychical we cannot tell, which possibly have more to do with the prevention and cure of disease than all the anti-toxins that were ever extracted from the serum of vaccinated cats and rabbits. How, except upon the supposition of some such strange mental or emotional agency, can we account for the undoubted successes of the modern Mattei remedies, with their green and blue "electricities" and other absurd attributes; for the perfectly imaginary, but none the less efficacious, virtues of simples and charms; for the triumphs of the quack, religious, and herbal, and the miracles of the saint? I know with what contemptuous scepticism facts like these are usually received by scientific men who do not investigate them, but the knowledge abashes me not a whit. If a disease, thought incurable, has been cured by some means to me unknown, by a pill or an impostor, by a relic or a shrine, by holy water or Christian science, my plain duty, as a professional healer, is not to sneer at it and disbelieve it, but to take pains to verify it; and having verified it, to discover, if I can, the method of its achievement. This is not only the most sensible, but the only scientific course. It will not be the first time that methods, sneered at by the science of the day, have led to the most startling and incredible discoveries. If we are indeed to regard ourselves, in Newton's noble phrase, but as children playing on the shore of the boundless ocean of Truth, it ill becomes us to dogmatise rashly upon what that ocean may or may not contain. How often has not the nescience of yesterday become the science of to-day, the heterodoxy of one generation the orthodoxy of the next. And with regard to those mysterious processes connected with the causation and cure of disease we should be particularly humble and cautious. The deepest thinkers and closest investigators have long recognised that there is more in what we call Life than the sum of its manifestations, or, in Dr. Gower's words, "than the processes it controls."

In illustration of this fact let us look at the disease we call epilepsy. We should doubtless all agree that this is a very real disease, the expression of a very serious state of nervous disturbance. Yet potent as are its effects, how inscrutable is its cause. For once we are spared the theory of bacterial origin. The pathology of the disease is hopelessly obscure. Indeed, as Drummond observes, "idiopathic epilepsy may be said to have no morbid anatomy, for the histological changes which have been observed from time to time are not only not constant, but must be regarded as secondary to the disturbance of function rather than its cause." Thus, the dilatation of the capillaries of the medulla, described by Schroeder van der Kolk, and the pigmentation of the cells of the same region, observed by Voisin, have very little significance; and the same may be said of the cirrhotic changes found by Meynert in the *pes hippocampi*. The current theory of the origin of epilepsy, according to Gowers, is that it is caused by the sudden liberation of nervous energy from certain unstable motor-cells of the cortical grey matter of the brain. What produces this sudden discharge? That there is an addition of forces is obvious, but whether this addition comes from within or without the organism, is unknown. Doubtless in certain states of the nervous system the equilibrium of the inter-molecular forces is so acutely unstable that the slightest addition one way or the other may liberate an enormous amount of energy, just as the weight of a few feathers thrown into an equally balanced scale might turn the balance of a hundred tons. None the less we have to account for this addition, minute though it be. We all know that the ancient and mediæval superstition was that the necessary impulse was external in origin, and was due to the malicious agency of some demon by whose "possession" the epileptic convulsion was brought about. But this theory is out of date now-a-days, though oddly enough the late Dr. Forbes Winslow revived it to account for a certain percentage of cases of so-called insanity. And a greater man than even Dr. Forbes Winslow is said to have believed in it thoroughly. But without discussing such a worm-eaten anachronism, I may remark that if we take the modern scientific view, that the cause of an epileptic convulsion must be ascribed to the liberation of latent nervous energy, it would seem to follow that the unknown force which is capable of so heightening normal function as to produce disease, may be equally effectual, given the necessary stimulus, to cure it. When a man who has been paralysed for years jumps up and runs out of the house at an alarm of fire, or gets off his stretcher and executes a *pas seul* when sprinkled with holy water at Lourdes, the fact that the cure may be due to the sudden liberation of vital energy produced by the stimulus of fear or faith, should not render it in the least miraculous or unscientific. Indeed, we have the testimony of Charcot that the faith cure is "an ideal method, since it oftens attains its end when all other means have failed." Yet, if this method is scientific in one case, why should it be unscientific in another? Why should not prayer, for instance, or any other rite or incantation, savage or civilized, provided of course that it sets free the necessary amount of nervous latent energy, suffice by equally natural means to cure a cancer. Remember that there are scores of cases in which this is claimed to have been actually done. Naturally enough you doubt the accuracy of the diagnosis in these cases; so do I, for there is nothing so scientific as doubting what we do not understand. Still, for all that, I am at a loss to see why it should not happen. For one thing we are still ignorant of the real nature of cancer. For another we know of no drug that will cure it. Think of it, medical science has existed for at least 4,000 years, and we have not yet discovered a drug that will cure cancer. For the matter of that, we have discovered very few drugs that are specific in any disease. Yet our only scientific reason for giving drugs at all is that they are chemical substances, depending for their efficacy upon the fact that the cells and molecules they act upon have themselves a definite chemical composition. As George Herbert quaintly expresses it:—

> Man is in little all the sphere:
> Herbs gladly cure our flesh, because that they
> Find their acquaintance there.

But though we have discovered no drug which will cure cancer, not even ichthyol, we do not know that cancer is incurable. Why, then, should its cure by mental means be thought so incredible a thing? We are all familiar with the fact, of which Dr. Herbert Snow has lately reminded us, that cancer is often predisposed to by mental causes. Over-work, anxiety, mental depression, nervous exhaustion—these are some of the commonest causes that predispose to malignant disease. How do they do it? Obviously, by so lowering the tissue-vitality—or, if you like, the tissue-resistance—by so depraving the nutrition and impoverishing the blood-supply of certain parts and organs, that degenerative changes are thereby induced or accelerated in them. That this is often a true explanation of the origin of malignant disease is borne out by the familiar fact that the organs and tissues most liable to cancer are those that are farthest removed from the heart or nutriment-distributing centres; those that once functional, have become functionless, as the uterus at the menopause; those, again, in which the forces of life are running out, such as cicatricial, neoplastic, and obsolete tissues. Yet if the origin of cancer is often due to mental causes, why should it be unscientific to look to similar causes for a cure? If fear, or grief, or anxiety, when unduly prolonged, can so lower the vitality of certain tissues as to produce degenerative changes in them, why should not hope, or faith, or happiness have a correspondingly stimulating and restorative effect? I, for one, know of no reason, and willingly confess my ignorance. Remember that these are not only problems of Health and Disease, but, primarily and essentially, problems of Life, not our individual life alone, but that universal Life in which we live, and move, and have our being.

But it is time I brought this already much too lengthy paper to a close. I have strayed far, I am afraid, from the beaten track of professional routine, and to many of my hearers I may seem to have floundered into a worse than Serbonian bog of useless philosophical speculation. My only excuse for so doing was the abstruse nature of my subject, and the hope that some of those present—over-wearied at times, like myself, by the endless multiplicity of detail with which modern medical science is weighed down—would be glad to escape with me for an hour into the fresh morning air of first principles, where the blighting monotony of the bacillus is unknown. And as we are most of us out on a sort of professional holiday, to attempt to lighten the labour of these learned proceedings seemed not altogether illegitimate. Of the many imperfections and crudities in my method of treating a subject so vast and various as the philosophy of disease, no one is more conscious than myself. Should I have induced any of those who have listened to me to ponder more deeply those profound questions which underlie all our theories of health and disease, I shall be amply repaid. For only by so doing can we hope to bring home to ourselves the truth of that pregnant saying of Dr. Gowers', " How much there is we cannot know and yet we cannot doubt."

TUBERCULOSIS OF THE SKIN AND CUTANEOUS MANIFESTATIONS OCCURRING IN SCROFULOUS SUBJECTS.

By A. W. Finch Noyes, F.R.C.S.E., &c.

Surgeon in charge of the Skin Department, Melbourne Hospital, and of the Skin Department, Alfred Hospital, Melbourne.

Tuberculosis being the subject selected by this Congress for special consideration, I have thought it might not be uninteresting to review briefly the manifestations which this pathological condition assumes in the human skin.

Besides conditions which are proved to be directly due to the action of the tubercle bacillus, there are not a few that occur in tubercular subjects, or in subjects with that predisposition of tissue, that " vulnerability " which favours the development and growth of the tubercle bacillus without being directly produced by its action. Some authorities go so far as to deny that this predisposition, known as scrofulosis, with its ill-defined limits, has any significance as an etiological factor, denying that there is any recognisable state beyond that which is directly conditioned by the tubercle bacillus. They scorn the term diathesis, and such like ill-defined expressions, declaring that they have no scientific foundation. On the other hand, this predisposition, this condition of the soil so to speak, is looked on as all important by some observers. We prefer to take a mid course, and to admit that there is a certain peculiarity of tissue which not only favours the development of the tubercle bacillus, but also predisposes to other pathological states. But it must further be admitted that inoculation with the tubercle bacillus, and this especially applies to the skin, not infrequently takes place in individuals in whom neither family nor personal history, nor the presence of other lesions, give any clue to the scrofulous state.

Certain pathological states then, as asserted above, are due to the direct influence of tubercle bacillus. Others occur in individuals with that peculiar vulnerability of tissue which favours the development of the bacillus, but which, so far as is at present known, are not due to the direct influence of that organism. We therefore divide cutaneous manifestations under consideration into two groups—

Group I.—(Diseases of the skin directly due to the influence of the tubercle bacillus)—Lupus vulgaris, scrofuloderma, verruca necrogenica, acute tubercular ulceration, tubercular lymphangitis.

Group II.*—Diseases of the skin occurring in scrofulous subject, which are predisposed to by a certain peculiarity of tissue, but are not proved to be due to the direct action of the tubercle bacillus)—Erythema induratum, or erythème induré des scrofuleux (Bazin), lichen scrofulosorum, scrofulous pustuloderms (acne scrofulosorum, &c.), tubercular eczema.

Lupus Vulgaris.

Lupus vulgaris is a new growth of the corium of the granuloma type, characterised clinically by the presence of nodules and infiltration, which may either become absorbed, producing atrophic scarring or ulcerate, with the subsequent production of scar tissue. The combination of the above processes, that is, the production of nodules, infiltration, and scar tissue formation, plus hyperæmia and inflammation, make up a large variety of clinical pictures.

Beginning with a small nodule usually, from a single focus, the lesions gradually increase with varying rapidity, without ulceration. Sometimes an area no larger than a threepenny piece or a sixpence is attained after many years' duration, atrophic scarring and disappearance of the lesion taking place. This is the mildest type of the disease. Larger areas may be involved, and without any ulceration the lesions may spread over almost the whole of the body surface. Absorption and atrophic scarring occurs in the centre, and the lesions spread by peripheral evolution (lupus serpiginosus). On the other hand, the nodules come to the surface; ulceration and discharge of the products of retrogressive changes takes place. The wound in the skin thus produced gives entry to pyogenic organisms, which may keep up the ulceration indefinitely. The destruction of tissue may be quite superficial or very deep, destroying all tissues but bone (L. vorex), mutilating the countenance and other parts in a horrible fashion. Various terms are used to express some peculiarity impressed on the tissues by the process. The papillæ of the skin may enlarge, producing L. papillomatosus. The surrounding tissue not infrequently hypertrophies (L. hypertrophicus), or wart-like growths may appear on the site of lupus lesions (L. verrucosus). The surface may assume somewhat the characters of lupus erythematosus, or may look not unlike eczema or psoriasis, the eczema lupus and psoriasis lupus of Hutchinson. These seem really to be cases of lupus vulgaris, without any other element of lupus erythematosus, eczema, or psoriasis, than that of clinical appearance. All these types are produced by one and the same initial process—*i.e.*, tuberculosis of the skin.

---

* This class does not of course include conditions which are merely increased in severity by this scrofulous state, as is eczema, so too are quite localised mycotic conditions as tinea tonsurans, and the same applies to syphilis and many other pathological lesions of the skin.

Certain non-typical forms are described by Leloir (*Annales de Dermatologie et de Syphilographie*, 1888), namely the colloid, in which colloid degenerative processes have taken place, corresponding with a similar colloid process in the lungs; lupus sclereux, corresponding with a fibroid tuberculosis of the lungs, and a myxomatous variety. Without pretending to have described all the clinical features of the disease, enough has been said to portray the large number of variations and the wide limits of the disease.

The theory of the tubercular origin of lupus vulgaris is of comparatively recent date. This was opposed by many good authorities, even after the discovery by Koch (1882) of the tubercle bacillus in lupus tissue. Even now there are some opponents of the theory. The evidence, however, on histological, bacteriological, experimental, and clinical grounds seems to me to be now overwhelming.

Histology*.—The elementary lesion or nodule of lupus, situated deep in the corium, consists of giant, lymphoid, and formative cells in a fibro-cellular reticulum. As the cells in the centre of the nodule increase in numbers the vascular supply is interfered with, and fatty degeneration and disintegration ensue in that part, and by extension of this necrobiosis, ultimately nearly the whole nodule is absorbed, or ulcerates, though at the periphery the new products may, according to Lang and Kaposi, organise into connective tissue and cicatrise, differing in this respect from leprosy and syphilis. All the structures that are found in miliary tubercle are present in lupus. Further inflammatory processes during ulceration are called into play—hyperæmia, inflammation, infiltration, degeneration, ulceration, and cicatrisation all play their part in producing the clinical picture familiar in lupus vulgaris.

Bacteriology.—Bacilli are found in the histological elements just described, which differ in no way morphologically from the tubercle bacillus. They exist in very small numbers, and are found with the greatest difficulty, but in spite of their sparse distribution, they are capable of setting up generalised tuberculosis in susceptible animals.

Experimental Evidence.—Evidence in support of the above statement is forthcoming from the experiments of Eve, Leloir, and others. Eve produced by inoculation of rabbits with lupus tissue a local disease closely resembling lupus vulgaris, and Leloir has frequently demonstrated the possibility of producing generalised tuberculosis in animals by inoculation with similar material, and also with artificial culture of the specific organism obtained from lupus tissue.

Clinical Evidence.—On clinical grounds there is very strong evidence of the identity of the organism which produces the pathological processes in lupus and phthisis. Many cases of direct and indirect inoculation are recorded where phthisical patients have transferred the disease in the form of lupus vulgaris. Wolter* relates two cases of direct inoculation of lupus. The most conclusive one was the case of a medical student who sustained a wound on the side of the head in a duel. Before this was quite healed he scratched it with its fingers, which were moist with phthisical sputum which he had been examining bacteriologically. Subsequently true lupus vulgaris developed on the site of the wound.

---

* Crocker, "Diseases of the Skin," Ed. II., p. 474.

Corlete† gives the history of a woman who nursed a phthisical friend, and on more than one occasion had mucus coughed into her face. Soon afterwards a small spot developed on the forehead; this finally assumed the typical character of lupus vulgaris, which involved and disfigured nearly the whole of the face. Many other similar cases might be quoted.

Under this heading may be mentioned the clinical symptoms, which occur after tuberculin injection, corresponding with manifestations that occur in other well recognised tubercular conditions. Though this is not proof positive of the tubercular nature of lupus vulgaris, since some other conditions which are not tubercular in a similar way re-act, yet it is a link in the chain of evidence.

Variations produced by Climate and General Surroundings.—Lupus vulgaris is very common in Germany, especially in the Rhine districts; it is common in France and Austria, and is also common in England (127 cases in 10,000, Crocker). In the United States it is described by Duhring as being "decidedly rare" (42 cases in 16,863). Not only does its ratio to other diseases vary in different countries, but its comparative severity also varies. In Australia it is much more rare than in England; my statistics give 11 out of 3,000 skin cases that have recently passed through my hands. It is also, so far as my experience goes, much less severe in character. In weighing the evidence regarding the severity of the disease but little informatian is to be gained from a histological or bacteriological examination. The histological elements of the nodule are much the same, whether taken from a large and rapidly increasing patch, or a small and indolent one, and bacilli occur in such very small numbers, even in the severest cases, that nothing is to be gained by such examination; we are therefore thrown back on clinical evidence alone.

The following are briefly the clinical notes of the cases that have come under my observation:—

Case I.—F., aged 40. Patch about size of threepenny piece at inner and upper portion of orbit. No sign of ulceration, patch has been ten years attaining present size.

Case II.—A girl, aged 10 years. The patch had commenced, when the the child was three years old, on the left cheek. There is no ulceration, and the patch, after seven years, is no larger than a shilling.

---

* *Deutsche. Med. Wochenschr.*, 1892, p. 808; Abstract, *Annales de Dermatologie et de Syphilographie*, Mai, 1893.

† *Journal of Cutaneous and Genito-Urinary Diseases*, April, 1893, p. 146.

Case III.—A lady, aged 45, presented a small patch on the nose less than a quarter of an inch in diameter, it had existed for two or three years.

Case IV.—Patient a cook, aged 40. Has had "a mark" on cheek for twenty years. Five years ago it began to spread, but has never ulcerated, and is now the size of a florin.

Case V.—A strumous-looking girl, aged 16, in whom the first lesion commenced ten years ago on side of the nose; it then spread to the cheeks. Subsequently the under surface of the chin, the right shoulder, and thighs became affected. In the three last-named positions the lesions were of the serpiginous type.

Case VI.—A married woman, aged 48, who states that twenty-five years ago the tip of her nose was accidentally pricked with a needle, a small papule formed, and gradually spread. At present the tip only of the nose is involved: there has never been any ulceration.

Case VII.—A woman, aged 28. The small patch, which is now no larger than the little finger nail, situated on the left cheek, just in front of the ear, commenced five years ago; no ulceration.

Case VIII.—The patient, a woman of 30 years, has a nodular condition on the left cheek, involving an area about half the size of the palm, which commenced three years ago; no ulceration.

Case IX.—A girl, aged 22, in whom the condition commenced nine years ago, both cheeks and nose extensively involved.

Case X.—Patient, aged 22. Her left cheek became involved twelve months ago, the right one about three months ago. The lesions consist of a few nodules, the whole area not being larger than a shilling.

Case XI.—A healthy-looking boy of 17. The lupus commenced eleven years ago, and now involves an area on the right cheek measuring 1½ inches by 3 inches; no ulceration.

In the above quoted cases, the two noticeable features are—firstly, the limited area involved by the new growth, even after the disease had lasted for a prolonged period, and secondly, the absence of ulceration. There were only three severe cases, Nos. V., IX., and XI. Two of these had been sent to me from London, and had improved very much during their stay in Melbourne. I do not deny that, occasionally, severe cases do occur, as in No. V. The patient was a most strumous individual, with old standing strumous keratitis and arthritic trouble. Such cases, however, are rare. I have had many extensive cases of ulceration about the face sent to me as lupus, but which were in reality tertiary syphilis.

It is generally admitted that the tubercle bacillus in lupus vulgaris exists in an attenuated form. This is accounted for by assuming the skin to be an unfavourable soil for the development of the organism, unfavourable because the temperature is, as a rule, much lower than that at which the bacillus flourishes. At 84 deg. F. the organism usually ceases to grow, and the skin temperature, not unfrequently, stands at or below this point.

Further, and this point so far as I can ascertain from the literature at my command, the action of light upon the bacillus must necessarily have an attenuating effect. There is very strong evidence to show that the bacillus gains entry to the skin from without and not from within, or by hereditary deposit, as Baumgarten would have us believe. In order to become inoculated, the bacillus must necessarily be upon the surface for some period of time, and become exposed to light. The exposure to direct sunlight necessary to kill the bacillus, according to Koch, varies from a few minutes to several hours (Sternberger). If the sunlight be diffused, considerably longer time is required. It is not impossible, too, that even when the bacilli are *in situ* in the corium, diffused sunlight may have some effect upon them.

A deleterious action may also be exerted upon the skin, as a culture medium, by the same agency. That sunlight may exert such an influence on culture media, is shown by the experiments of Roux.

I would account, then, both for the comparative rarity of true lupus vulgaris, and for its milder type in Australia by—

(1) The greater exposure of its inhabitants to direct sunlight.

(2) The absence of tendency to hyperæmia and stagnation in exposed parts due to the effect of cold. This is probably the element which accounts for the greater activity of lupus during the cold winter months in England and Europe.

(3) Increased tissue resistence. It is true that lupus is no respecter of persons so far as the rich and the poor are concerned, but it is also true that it assumes a much more severe type amongst the poor half-starved ill-nourished individuals, so common in the larger cities of Europe and so rare in the cities of Australia.

SCROFULODERMA.*

By this term is meant a suppurating dermatitis, which occurs in scrofulous individuals. It may attack the skin, either in connection with a more deeply seated lesion, as strumous glands, or tubercular processes in bone or joints, or independently of any underlying tubercular lesions. In the former, it commences by swelling and reddening of the skin, which breaks down, the contents are evacuated, and several sinuses form, or an unhealthy ulceration, with undermined edges, and deep red or violaceous border is produced. A superficial ulceration may start from this point, involving larger areas beyond the limit of the subjacent tubercular tissue. Sometimes this more superficial condition takes on the characters of a lupus vulgaris, thus linking together the two tubercular processes. The deeper ulceration is probably produced by the conjoint action of the tubercle bacillus and one of the pus producing microphytes.

Scrofuloderma, occurring independently of any deeper seated tubercular process, commences as fluctuating nodules, of a dark red or violaceous colour. These gradually enlarge, and generally rupture, or they may become absorbed without producing ulceration.

---

* Some authorities use this term in a much more extended sense, including, besides strumous ulceration, other conditions, as lichen scrofulosorum, and erythema induratum scrofulosorum.

BURROUGHS, WELLCOME & Co.
LIBRARY
No.

VERRUCA NECROGENICA.

Verruca necrogenica, or anatomical tubercle, tuberculosis verrucosa cutis (Riehl and Paltauf), and lupus verrucosus are all bacteriologically and histologically identical. The latter may occur on the site of an ordinary lupus vulgaris, and this is the clinical connecting link between the two conditions.

Verruca necrogenica occurs for the most part on the hands of those who handle animal tissue in which the tubercle bacillus exists, pathologists, *post-mortem* porters, butchers, cooks, &c. Occasionally it occurs in individuals who are not thus occupied. Dr. Harrison, of Clifton, England, recently showed two cases—one was in a commercial traveller in the cloth line, the other was a warehouseman's packer. In a case under my own care, the patient was an ordinary labourer.

In another case of my own, the patient was a clerk, the subject of well marked phthisis. Eighteen months previously, small papules appeared on the knuckles of the middle and little finger of right hand; they are now about the size of sixpenny pieces, and present typical warty characters of verruca necrogenica. This is probably a case of auto-inoculation, and is an interesting link in the chain of evidence regarding the tubercular origin of the growth. Sometimes the converse sequel of events occurs. Dr. Pringle (*British Journal of Dermatology*, January, 1895) mentions the case of a medical man who developed general tubercular infection from a verruca necrogenica. The new growth commences as a papule or pustule, subsequently becomes papillomatous and warty, and may spread, involving an area as large as the back of the hand, where it often occurs.

ACUTE TUBERCULAR ULCERATION.

This condition is observed only in advanced cases of pulmonary or intestinal tuberculosis. The ulceration is irregular in shape, and covered with granulations of a yellow colour. They usually occur about the oral or anal orifice, occasionally elsewhere. They are very intractable, and not infrequently spread beyond the original limits. The cause is an auto-inoculation. The tubercle bacillus can be demonstrated by bacteriological methods.

TUBERCULAR LYMPHANGITIS.

In this rare condition the tubercle bacillus would seem to find its culture media in the lymphatic vascular trunks. More or less impediment to the flow of lymph takes place, with consequent elephantiasis of the part. Nodules with a pink, dusky red, or violaceous colour occur in the course of the affected lymphatics. They ulcerate and discharge their contents—a purulent-looking matter. Sometimes lymph is discharged in which the bacillus may be found.

As pointed out by Pringle (*British Journal of Dermatology*, January, 1895, p. 8) this manifestation of tuberculosis, though rare, is a well recognised one, and is known in France as lymphangite tuberculeuse, of which there are some excellent models in the St. Louis Hospital Museum, described under such headings as lymphangiectasic suppurative d'origine tuberculeuse, tuberculose cutanée lymphangite tuberculo-gommeuse.

Most of these I have had the opportunity of examining, but have not since recognised any similar case.

In the case described by Dr. Cahill, the origin of the affection is attributed to infection from a growth of the nature of verruca necrogenica.

ERYTHEME INDURE SCROFULEUX (Erythema Induratum).

This condition, originally described by Bazin under the above name, has been occasionally referred to by other authors. By Crocker it is described as erythema induratum. Colcott Fox, *British Journal of Dermatology*, August, 1893) has revived interest in the subject by his excellent contribution in 1893. According to this authority the lesions, which are nodular in character, of a red or violaceous hue, gradually rise to the surface, involving the superficial layers. They vary in size from a split pea to a hazel nut, or larger. Indolent in course, they may absorb, suppurate, or necrose. They vary in number from six to eight, and are usually distributed over the posterior aspect of the leg below the calf, but have been observed in other situations. Young strumous girls are most liable to the condition. Whether the tubercle bacillus has any direct action in the production of the lesions is a point not yet settled.

I have had the opportunity of observing two cases at the Melbourne Hospital. The first was diagnosed as scrofuloderma, before Dr. Fox's paper was written, but subsequently it was recognised as a typical case of the disease under consideration. The second one occurred in 1894, and was immediately recognised.

LICHEN SCROFULOSORUM.

This condition is a mild affection characterised by the production of small papules of a yellow, red, or fawn colour, surmounted by a minute scar, and usually situated on the trunk. The papules are distributed in groups, which may be either round or oval in shape. The intervening skin is usually quite healthy in appearance. The eruption gives rise to no subjective symptoms, nor to any constitutional disturbance. Phthisis, a phthisical history, or evidence of scrofula are generally present.

Anatomically (Kaposi, *Pathologie und Therapie der Hautkrankheiten*, p. 455) the lesions, groups of which constitute the affection, consist of a cell infiltration and exudation in and around the hair follicle and its attached sebaceous gland, so that it constitutes a distinct papule in the follicular orifice and its vicinity. The papillary swelling and infiltration represents the papule, and the accumulation of hyperplastic epidermis, or of exudation into the follicular orifice, produces the central scale or pustule.

Lichen scrofulosorum does not conform to the definition of a true lichen. The term minute papular scrofulide that has been suggested is much better. Dr. Jacobi (Transactions of the German Dermatological Congress III., 1891) confirms Kaposi's observations regarding the minute anatomy. He further states that the arrangement of the morbid products is very like that of miliary tubercle, and he found a few bacilli. Should these observations be confirmed, this disease must be placed in Group I. It must be observed, however, that the bacillus must be in a very attenuated condition to be capable of producing an eruption of so mild a type as lichen scrofulosorum. Reaction has been obtained with tuberculin. I have often observed the disease in London hospitals, but have not seen any examples in Australia.

Scrofulous Pustuloderm.

Under this heading may be included many pustular conditions occurring in scrofulous subjects. They are possibly all phases of one and the same process, though differing in some details. There is the comparatively well-known acne scrofulosorum; the acne scrofulosorum occurring in infants, as described by T. C. Fox (*British Journal of Dermatology*, November, 1895, p. 342), and the conditions described by Malcolm Morris (*British Journal of Dermatology*, 1893, p. 341), and Louis Duhring (*American Medical Journal*, 1882, p. 70), as pustular scrofulide, and small pustular scrofuloderm. They all have this in common, that the lesions are eventually pustular; they occur in connection with the follicles of the skin, are more or less violaceous in colour, leave scar, and are observed in scrofulous subjects.

Tubercular Eczema.

Unna, who originated the term, gives the following description of the condition (*British Journal of Dermatology*, Vol. III., p. 178):—"Tubercular eczema in my own limited and specific sense we find almost entirely in the case of children, seldom in young people, never in the aged. It always begins near the mucous orifices—viz., of the eyes, nose, mouth, and ears, and in connection with conjunctivitis and keratitis phlyctenulosa, which are likewise suspected to be tubercular, and with photophobia, rhinitis, or otitis media. It is always characterised by the œdematous and cushion-like, at first soft and afterwards firm, swelling of the affected parts of the skin, especially of the lower eyelids, of the upper lip, and of the sides of the neck below the ears, then by a constant and severe swelling of the neighbouring lymphatic glands. The latter are soft, pulpy (markig') to the touch, and are much more voluminous than the hard, small gland-tumours of the neck, occurring in connection with some seborrhoic eczemas of the scalp. The skin affection itself shows neither typical small eczema vesicles nor dry papules as primary efflorescences, but very superficial large vesicles, which quickly dry up into scabs, after the falling off of which a profuse weeping, with a quick reappearance of thick, yellow and brown scabs, takes place. The subjective symptoms are very slight, the tubercular eczema being accompanied by very little itching as compared with the seborrhoic. By the localisation, the concomitant tubercular phenomena, the swelling of the lymph glands, the œdema, the erythematous, profusely oozing vesicle, and scab formation character, and by the absence of itching, this eczema is so well and so simply characterised as hardly any other type of eczema is."

In scrofulous subjects, common eczema is often more obstinate and more severe on account of the greater "vulnerability" of the tissues, and their indisposition to respond to therapeutic agents. Of course this condition is not included in the term tubercular eczema. The so-called eczema lupus of Hutchinson is also totally different.

The object of this paper has been to show that tubercular processes in the skin, so far as my observation of 3,000 skin cases is concerned, are comparatively rare in Victoria. One of the types observed (lupus) is milder than in other countries, with regard to which an explanation has been attempted. Further, it has been my object to define as clearly and concisely as possible all the other manifestations of processes which are either tubercular in origin or which occur in scrofulous subjects, so that cases occurring from time to time may be recognised, and modifications, the result of climatic and general environment, may be noted. Such observation may shed some light on similar processes in more obscured tissues, for the skin of all the tissues of the body is that which lends itself most readily to the accurate observation of pathological processes under the influence of natural or artificial agencies.

A FEW NOTES UPON AN UNUSUALLY LARGE GALL STONE, PASSED DURING LIFE, WITH SPECIMEN.

By Albert Martin, M.D., M.R.C.P. Lond., Wellington.

The patient *æt.* 52. F. Spare habit. Suffered every four or six months from severe hepatic pains, without jaundice, for seven or eight years.

In addition to a swelling over the region of the gall bladder about the size of a Tangerine orange, she was the subject of movable kidney on both sides, complicated with cystitis.

When seen for the first time in 1888, a diagnosis of gall stone was made, probably ulcerating into the transverse colon, and two days after the specimen I bring to your notice was found in the evacuation, coupled with considerable diminution of the hepatic swelling.

An interrupted recovery took place with no return; but two years afterwards both kidneys were affected with suppurative pyelitis, from which she also recovered, and a few weeks ago she underwent a successful operation for cataract.

BRIEF NOTE ON A NOVEL METHOD OF TREATING TUBERCULOSIS OF THE LUNGS.

By JAMES MURDOCH F.R.C.S. and L.R.C.P. EDIN.,
Hon. Physician, Christchurch Hospital.

My friend Professor Bickerton, of Christchurch, has for some time had an enthusiastic belief in the treatment of phthisis by the inhalation of chlorine gas. This, however, is not backed up by bacteriological demonstration. It was this idea, however, which gave me the clue to, and still forms a component of, the treatment I am about to describe.

Before entering into details it may be as well to state that all results given here are based upon bacteriological observations, in which I have been greatly assisted by Messrs. Gilruth and Parkes (Government bacteriologists), Dr. Murray Aynesley (of Christchurch Hospital), and much more especially Mr. Charlton (of Christchurch), who has obtained numerous specimens of sputa for me and taken a great interest in the results.

Cyanide of gold is, I believe, the most deadly poison to the tubercular bacillus, and next to this comes perchloride of mercury; but neither of those can be given in sufficient quantity without not only risk, but death to the patient before the bacillus. A means occurred to me, however, by which perchloride of mercury in ample quantity for the destruction of the bacillus, and yet, with care, innocuous to the patient, may be given.

My treatment briefly is as follows :—A room is chosen and divested of all but the barest necessaries in the way of furniture, and these are rendered as aseptic as possible. When the patient enters this room fresh aseptic clothing is provided for him, and he never leaves it except to go straight into the open air by the shortest route possible on sunny days. The patient is then put upon a mild mercurial course. My ordinary prescription is a pill, consisting of half a grain of calomel and a quarter of a grain of codeine three times a day. The codeine not only prevents the calomel going straight through the bowels, but has a soothing effect on the cough.

At the same time chlorine gas is generated in the room by the simple process of pouring some vinegar or hydrochloric acid on some chloride of lime, which is placed in one corner of the room. A tablespoonful of the chloride of lime, having added to it three or four times a day about 20ms. acid hydrochlor. fort., will be ample to start with, but I always find the patients take an interest in this process, and allow them to increase the amount of gas, which most of them not only do not object to, but absolutely like, when they have become a little accustomed to it. This process, I believe, produces perchloride of mercury on the tuberculosed spots, and I would here mention that not only is perchloride of mercury fatal to the bacilli, but that it and the other salts of mercury have a singular selective proclivity for tubercle. Mr. Parkes, of Wellington, has shown me several slides proving this.

What I believe happens is this: The calomel is converted into perchloride of mercury by the gastric juice: this being absorbed into the blood, its alkalis convert it into ammonio phosphate of mercury. This again, on meeting the chlorine on the moist, exposed, tuberculosed patches, is instantly reconverted into nascent perchloride of mercury, with the result that the bacilli are instantly destroyed.

I have seen calomel, I forget for what purpose, placed in the eye of a patient under iodide of potassium instantly turn into the red iodide of mercury. This is a somewhat similar action.

My thanks are again due to Professor Bickerton for his explanation of the chemical action which takes place.

The resulting destruction of the bacilli is no longer in the least doubtful in my mind, for I have proved it microscopically over and over again.

The treatment is too new to give much history of results, but, so far, they have come quite up to my expectations. In my first case the patient had general tuberculosis, but by this means her lungs were over and over again rendered free of bacilli, but were reinfected from the numerous other adjacent sources. It will be seen from this that the great danger is re-infection, but in incipient cases, where the lungs only are infected, I believe the treatment is absolutely effectual.

I have under my care just now a young lady whose only symptoms at first seemed to be a feeling of malaise and a heightened temperature, which at nights rose as high as 100 to 101·4. As she had a slight morning cough, and, I thought, perhaps, the least possible increase of vocal resonance, at one apex, I got her sputa examined, and found numerous tubercular bacilli. She was at once put under my treatment, and in less than a week not one was to be found, and this result has been maintained; also her temperature has come down to normal, or sometimes a point over, the cough has disappeared, and she has gone to the country feeling well. In several other instances I have obtained similar results.

Everyone will see, however, that it is difficult to carry out the treatment; also it is not applicable to advanced cases where there is any tendency to hæmorrhage, for it will be seen that the diseased spots are practically curetted.

The first thing to do is to obtain the hearty co-operation of the patients, and make them understand that when the lungs are free of bacilli they are still ripe to receive re-infection.

The treatment must not be carried on too long, three or four days at a time being generally sufficient, and if re-infection occurs it must simply be repeated. Immediately after the treatment I generally put my patient on guiaacol or creasote, as I believe they tend to dimininish the tendency to re-infection by rendering the blood more or less antiseptic.

I would repeat that, as far as my experience goes, the treatment is not safe in advanced or hæmorrhagic cases.

Also begin gently with the chlorine, as its effects are very different on different patients.

Talking over the matter with Dr. Batchelor, he suggested that a moderate continuance of the inhalation of the gas without the mercury might probably be the best means of preventing re-infection. This idea I believe to be a very good one, especially in those cases where the patients actually enjoy the inhalation.

I hope to be able shortly to give full tabular results of cases treated. I had not intended to bring the treatment before the profession until these were prepared, with further proofs of its efficacy, but at the request of several members of the Congress, have thus briefly done so in the hope that other and abler physicians than myself may at once give the treatment a fair trial in really suitable cases.

ON A CASE OF COMPLETE LEUCODERMA.

By Mr. Pulleine,

Medical Student, Adelaide, S.A.

Partial leucoderma is not unfrequently met with in hospital practice, generally in the form of irregular symmetrical patches on the face, arms, and hands, around which patches there is a darker areola, as if the pigment cells formerly occupying the white area had been driven back and formed an aggregation at the margin. Various writers place the frequency of occurrence of partial leucoderma at two or more per thousand. Coloured races are most liable to it, and it is generally believed to be due to deficient or perverted innervation of the skin, the fault being probably in the sympathetic nerves. Cases, however, where the leucoderma involves the skin of the whole body seem to be exceedingly rare. Hebra and Kaposi seem never to have seen one, nor do Tilbury Fox, Erasmus Wilson, McCall Anderson, and other writers mention a case. Stellwagen, of Philadelphia, records the case of a negro who turned white. Morell Mackenzie mentions another in which anosmia was associated with leucoderma, and Liveing, in his text book on skin diseases says, that leucoderma, the " white leprosy " of India, sometimes reaches such an intensity that Hindoos may become entirely colourless. The loss of pigment in the skin is rapidly followed by whitening of the hair of the body, face, and head. It seems never to be a congenital defect, and the youngest recorded case was in a child four years of age. Various predisposing causes are mentioned, the most frequent being hot climates, alternations of heat and cold, and mental strain.

The case under review was admitted into the Adelaide Hospital in the latter end of 1895. The patient, Simon Gabriel, was 40 years of age, and born in Mauritius. Both parents were Goanese Portuguese, the father being darker than the mother. He was one of a family of ten ; all were very dark, and of the colour of a well used copper coin ; his hair and beard are straight, and formerly very black. Leaving home at nine years of age, and going to

England as a page boy, he has spent most of his life as a cook on East Indian liners, at hotels, and restaurants, and four years ago was head cook at the Adelaide Hospital. He married a white woman, and his children are light copper coloured, with very dark eyes.

About eight years ago his attention was drawn to a white spot on left side of his forehead from which the hair was beginning to recede: he used to comb his hair over to try and hide it. When first noticed it was small, about the size of a threepenny piece, and pure white in colour; the edge was markedly defined, he attempted to stain the spot with hair dye. Later on the area enlarged irregularly downwards and at the sides, invading the left cheek, another patch started on the right cheek and he had a spotted face. The patches did not spread backwards in the direction of the hairy scalp, the pigmentation of which seemed to gradually fade away. At the same time the colour of the skin of the thorax, abdomen, and limbs grew fainter and fainter without any occurrence of patches, and in 1892 the body was of a uniform light copper colour, while the white patches on the face had involved nearly the whole of the forehead and cheeks. In 1894 the discolouration was quite complete, except in the three situations where there is still a little fast fading pigmentation. The presence of moisture seems to have determined the tardy disappearance of the pigment in these places: a thin dusky line is seen on smoothing out a transverse wrinkle of the front of the neck, thicker lines in the folds of the groins, and an irregular dark patch in each axilla.

During the disappearance of the pigment the patient did not suffer from constitutional irregularities of any kind, eat as much as usual, and drank not always in moderation. The patient has frequently suffered from acute rheumatism, and formerly from malarial fever.

Since his colour disappeared he has become freckled on exposure, the freckles being very large and lighter in shade than the original colour. The patient would now pass for an European. His skin is of extraordinary whiteness, the hair and beard losing their colour, and the small hairs in the body and limbs are silvery. The patches in the axillæ have decreased in size while he has been under observation. All the special senses are apparently normal, and his tactile acuteness unimpaired.

SECTION OF SURGERY.

PRESIDENT'S ADDRESS.

By Henry O'Hara, F.R.C.S.I.

Senior Hon. Surgeon, Alfred Hospital, Melbourne.

Gentlemen,—

To elect a member of our profession to the President's chair in any section of the Congress is the highest honour which the Committee can bestow upon him. My first duty then is to thank the Committee for their very graceful act in inviting me to preside over the Section of Surgery. But while I fully appreciated the honour, my first impulse was to decline it. The invitation came to me at a time when I was recovering from a protracted illness, and moreover, as I had never held or sought office in any of the medical societies to which I have belonged, I naturally felt some hesitation before undertaking duties that would be quite new to me; but on further considering the matter I felt that the compliment was intended not only to me personally, but also to the hospital and city to which I belong, and therefore decided that it was my duty to accept the position.

The science of Surgery is advancing with such rapid strides, and the material at hand is so vast, that in an address of this kind it is only possible to touch lightly upon some of the subjects of chief practical interest to a body of surgeons.

It may astonish the majority of those here to-day to hear me express my regret that it should have been found necessary to divide Medicine and Surgery into separate sections at the Congress. The two sciences are so closely allied that I feel each section must be losing much valuable teaching in many subjects of common interest. There are in these days of over-specialism certain specialties which can stand alone, as for example that of the oculist: but the general surgeon must be a physician, and I hold that, to gain eminence as a surgeon, one must possess in a high degree the diagnostic powers which are so generally associated with the physician. I cannot do better than quote the words of so high an authority as Erichsen—"The surgeon must be prepared to deal with complex problems, the solution of which can only be afforded by an intimate general acquaintance with the sciences of surgery and medicine." In our work we are constantly brought face to face with this fact. Take, for example, a case of renal stone in its early stage, when possibly slight pain and general malaise may be the only symptoms. Every surgeon knows how indefinite such symptoms may be, and yet how important it is to make an early diagnosis, and remove the stone before the occurrence of pyelitis, with its accompanying constitutional disturbance, makes the condition too evident. Perhaps a better instance is an attack of appendicitis; is it not of paramount importance to know when to interfere and when to leave alone? Your medical knowledge is taxed in eliminating the condition from the numerous diseases which may simulate it, and your surgical skill is taxed in relieving the condition when you feel that it is your duty to your patient to open the abdomen. Is not your medical knowledge also taxed to its utmost in deciding whether the physical condition of your patient is such that a surgical operation is advisable, or even justifiable? From the opinions expressed by the physicians of to-day, we infer that the operative procedures advocated in this all too common disease by such surgeons as McBurney are considered by them unnecessary in the majority of cases. Can there be a better argument in favour of the combination of the physician and surgeon in one individual, or the advantages that would attend the discussion of such problems by a mixed body of medical men?

I think it will be admitted on all hands that the surest road to success in any branch of the profession is gained by the vast experience of a general practice, and we are every day reminded by living examples of this fact, the most eminent men of our day having commenced as general practitioners.

Any address on contemporary surgery would be incomplete without reference to the loss we have sustained through the death of Pasteur, whom I may well style the modern surgeon's greatest benefactor. That his discoveries revolutionised surgery is evident when we contrast the ante and post Pasteur epochs. Fortunately for us, he had done his work and done it thoroughly. His belief in the progress of scientific research is well instanced by the following remarks from one of his latter-day speeches, which are especially applicable just now:—"I hold the invincible belief that science and peace will be victorious over ignorance and war, that the nations will agree not to destroy but to build up, and that the future will belong to those who shall have done most for suffering humanity."

Pasteur undoubtedly first established the germ theory of putrefaction, and Sir Joseph Lister, realising its immense importance, put it into practical use, and introduced to the world the antiseptic treatment of wounds.

For a short period we were satisfied to believe that if, during a surgical operation, disease germs should happen to invade the wound, we had at our command chemical substances with which we could destroy them and render the parts germ-proof. It was often found, however, that these germicides materially affected the welfare of our patient. Even fatal cases occurred as the result of the toxic effects of our antiseptics. I remember well, as a house surgeon, having charge of a large carbolic spray producer, and being instructed by the operator to direct the steam into the peritoneal cavity during a laparotomy which lasted nearly two hours.

This state of things did not last long, and gradually the technique underwent such material changes that to-day, instead of relying upon these potent germicides to destroy the invading bacilli in surgical wounds at such risk to the lives of our patients, we render the field of operation sterile, and undertake our work with clean hands and sterilised instruments, using no stronger lotion than plain boiled water, and this we call asepticism.

Having had a large experience in operating under various atmospheric conditions, I have come to the conclusion that, where sepsis occurs in a wound, it has in most cases been introduced by the operator's hands, or by the materials employed during the operation. Although fully alive to the value of the demonstrations of Pasteur, Tyndall, Lister, Miguel, Koch, and others, in regard to the impurities held in suspension by the air, I maintain that, in a room well supplied with sunlight, the germs producing the fermentative processes of fœtid putrefaction seldom exist.

The recent researches of Haenel (*Deutsche Med. Wochenschrift*, 1895, No. 8) in this respect go far to prove the importance of aseptic, as compared with antiseptic, methods. In his experiments he introduced into wounds tampons of gauze, containing pathogenic staphylococci and streptococci, and after a few hours, having removed the tampons, washed out the wounds with a 3 per cent. carbolic acid solution in some cases, and a ·6 per cent. saline solution in others. This irrigation was persevered with daily, and yet the toxic effects which were produced were the same in both series of cases, clearly proving that antisepsis fails to dislodge or destroy pathogenic organisms when once introduced into a wound.

The most elaborate instructions are now given for the preparation of room, instruments, &c. To my mind, simplicity in carrying out these precautions is of all importance.

In my own practice the instructions are as follows:—The operating room to be sulphured for six hours before operation. All the water required for use to be boiled and kept in covered glass jars. All tables to be glass topped. The sponges, having been freed from sand and grit, to be wrung out of a strong solution of permanganate of potash, then whitened with a saturated solution of oxalic acid and wrung out of boiling water, then placed in carbolic solution 1 in 40 ready for use. Instruments to be boiled for five minutes in soda and water. All silk ligatures to be boiled in test-tubes immediately before use. The operating table to be covered with a sheet which has been wrung out of a 1 in 2000 solution of hydrarg. perchlor. and dried in the sun. My hands and those of my assistants having been thoroughly scrubbed with ichthyol soap in hot water, to be then soaked in a solution of hydrarg. perchlor. 1 in 1000 for two or three minutes, and allowed to dry. The field of operation to be prepared by shaving when necessary, and then thoroughly washed with ichthyol soap and water, rubbed over with ether; a compress of hydrarg. perchlor. 1 in 2000 is then applied and allowed to remain until the operation is commenced.

The most prominent feature in the treatment of disease of late years has been the introduction of sero-therapy, and the most successful results up to date have been achieved with diphtheria. In 1890 Behring, of Berlin, published his discovery that the serum of immune animals had a specific action on the diphtheria bacillus. To obtain a sufficient supply of the serum, different animals were experimented on, and it was finally decided that the horse was the most suitable. He was found to resist, without suffering, immense doses of the diphtheria poison, and a large supply of the serum could be obtained by simply tapping the jugular vein—a painless proceeding in the case of the horse. The published results of such authorities as Ehrlich, Kossel, Wasserman, Roux, Washbourn, Goodall, and Card, in

Europe, are sufficiently satisfactory to induce us to use the serum in every case. It may not be a specific in all cases, but it has given the most marvellous results in the most hopeless cases and reduced the mortality to less than one-half of that recorded before its introduction. Professor Bokai, medical officer to the Children's Hospital, Buda Pesth, reported in the *British Medical Journal* that, with the use of Behring's serum, he reduced his mortality from 61·7 per cent. to 14·28 per cent., Lœffler's bacillus being found in every case. He intubated most of his cases, and I think this was a considerable factor in bringing about so brilliant a result, for by intubation aëration of the blood would take place unchecked until the antitoxin had taken effect. I have taken much interest in these results, for previous to the introduction of antitoxin during an epidemic of malignant diphtheria five years ago I saw fifty-two cases in consultation. Tracheotomy was performed in every case to relieve the breathing, and all the known remedies applied, but so overwhelming was the poison that every case succumbed, and I doubt if a case of malignant diphtheria has ever been successfully treated before the introduction of antitoxin.

Within the last few months anti-streptococcic serum has been prepared by Dr. Marmorek, Mr. Bokenham, and others, and has been used in various septic conditions, such as cellulitis and erysipelas neonatorum; but too little has been done as yet for any definite opinion to be formed as to its efficacy.

A subject of great importance in Australia is the treatment of snake-bite. From experiments made by Professor Fraser, of Edinburgh, we may hope to be armed before long with an antitoxin obtained from the blood of the snake itself.

No satisfactory results have been obtained as yet in the sero-therapy of tetanus or hydrophobia.

The treatment of diseases, the result of microorganisms, by the introduction into the system of the antitoxin is as yet only in its infancy, but the results so far have been so encouraging that it seems only reasonable to hope that the day is not far distant when specifics will be found for all infectious diseases as reliable in their action as mercury undoubtedly is in the treatment of syphilis.

So absolutely hopeless is a case of inoperable cancer that any remedy suggested will be gladly welcomed, and will not lack the benefits of a fair trial. That a malignant tumour has disappeared after an attack of erysipelas is an established fact. In my own practice I have had such an experience. The patient, aged 50, had a well-marked scirrhus of the right breast, with involvement of the axillary glands. I removed the breast, and cleared out the axilla. In two years' time the patient consulted me for a small recurrence in the axillary scar, the greater portion of which I was able to remove; some of the deeper parts were so intimately mixed up with the artery and vein that I had to leave them. Two days after operation she developed an attack of acute cellulitis, which extended down the arm to the hand. It was necessary to make free incisions into the arm and back of the hand, and convalescence was slow. However, it is now six years since the last operation, and she is in perfect health, with no signs of recurrence.

Fehleisen has had a similar experience with a case inoculated with pure cultures of the streptococcus erysipelatis. Bruns and Coley have seen improvement follow an attack of erysipelas, and state that the results were more satisfactory in sarcoma than carcinoma. Coley also states that the factitious erysipelas has not been attended with such good results as the accidental.

In treating a case of inoperable recurrent carcinoma four years ago I was astonished to find that a strong solution of ichthyol seemed to arrest the growth. The patient's health improved, and the pain, which was constant and severe, gradually diminished. I determined to push the ichthyol, and injected one drachm of a 10 per cent. solution into the margins of the growth daily. The improvement was most marked, and when she left my care to return to England she had put on weight, felt well, and the ulcerated surface had healed considerably at its edges, and was only one-third the size it had been two months previously, and all disagreeable odour had completely disappeared. I was not able to trace the patient subsequently, and cannot therefore say what the ultimate result was. I have now under my care a lady whose breast I removed three and a half years ago for a scirrhus that had arrived at the stage of surface ulceration. The axilla appeared to be free at the time, and her strength failing I did not remove the glands, as is my custom. A year afterwards the glands became affected, and there was marked œdema of the arm. I then cleared out the axilla, and prescribed her ichthyol internally. She put on flesh and improved rapidly in her general health. A small recurrence took place in the scar subsequently, which was removed, and in spite of all this operative interference she is now in better health than she was four years ago; has no sign of disease, and is still taking an ichthyol pill three times daily. I could quote many other cases of inoperable carcinoma where decided improvement took place after the administration of ichthyol, but I cannot claim to have absolutely cured one case, and I only bring it before you as a useful adjunct in the treatment of inoperable cancer. In sarcoma the results have been negative.

If the parasitic theory of cancer expounded by Professor Foa at the Medical Congress in Rome proves to be correct, we are then within measurable distance of finding some remedy for it. He describes the parasites as endo-proto-plasmatic bodies, para-nuclear, enclosed in a capsule with a double outline, and consisting of thin protoplasm with a small central body. Mr. Plimmer corroborates Professor Foa's observations, and states that he has found the parasite in 400 consecutive cases at the Cancer Hospital. Our clinical experience of contact cancer, of the so-called cancer houses and cancer districts, and the constant examples of husband and wife and many members of the same family being attacked by it help to strengthen the theory that cancer is an infectious disease. Until, however, satisfactory proof of its transmissibility by inoculation are forthcoming, the infective theory cannot be regarded as established.

I was much impressed with a paper by Mr. Arbuthnot Lane, in the "Transactions of the Clinical Society" in the early part of last year, on fractures of the long bones of the lower extremity. Mr. Lane, after examining a considerable number of cases in which such fractures had been sustained during and after middle life, stated that the average financial depreciation of many varieties of labourers after such an injury was enormous.

Haenel brings forward statistics which corroborate the opinion of Mr. Lane. I should be sorry to think that our results were so disastrous; at the same time I quite agree with Mr. Lane that, in certain cases of oblique fracture of both bones of the leg occurring low down, the wisest course is to expose the fractured ends, and having brought them into apposition to fix them there. I have found division of the tendo Achillis very useful in bringing these fragments into apposition. It appears to me that, in these days of asepticism, early operation in suitable cases would give results so satisfactory that this procedure should become a routine treatment in all cases where mechanical appliances and division of tendons cannot be relied upon to prevent deformity.

White's method for the relief of enlarged prostate gland by castration has been performed in a large number of instances, and if the published results are absolutely reliable then there is a great future for that operation, but out of seven cases in which I adopted this treatment only one can be said to have benefited to any extent. The operation I have found most satisfactory is to open the bladder in the supra-pubic region, and remove as much of the central lobe as bulges into the bladder, then by forcing my finger gradually through the prostatic urethra to thoroughly dilate that portion. In a most intractable case upon which I performed this operation on a patient of my friend, Dr. Weigall, two years ago the result has been most satisfactory. This patient absolutely declined to subject himself to the mutilation of castration. I have never known a supra-pubic fistula to result, and there has been no mortality. Moullin, Swain, Fenwick, and others have published successful cases of White's operation; but Faulds, on the other hand, in the *British Medical Journal*, May 4, 1895, records six cases, in five of which the patients went mad, and the sixth died, having developed hemiplegia after the operation.

In abdominal surgery, the progress made since our last Congress has been phenomenal; and it must be a great pleasure to the profession of this city to feel that one of their comrades (although lost to them now for ever) contributed much to this progress. I refer to the late Dr. Maunsell, who until quite recently was one of the leading surgeons of New Zealand. His operation for the anastomosis of intestine stands pre-eminently without a rival. Numerous appliances had been suggested to facilitate the difficult task of bringing the divided ends of intestine together—animal's trachea, oiled cardboard, decalcified bone-discs, pieces of potato, carrot, and other vegetables, lumps of dough, &c. Maunsell realised the dangers of placing solid bodies in the intestinal canal, and devised the method of suture which will keep his memory green when the majority of mechanical devices are forgotten.

My experience with Murphy's button, which was more recently invented, has been very limited, but I cannot speak too highly of this very ingenious contrivance in the anastomosis of gall-bladder to intestine, where from any cause the common bile duct has become obliterated or permanently obstructed. In two such cases I found the button answer admirably, and in each case it passed on the ninth day without causing any inconvenience. I should advise its application also in cases of gastro-enterostomy, which do not seem to me so suitable for Maunsell's operation. Dr. Finch Noyes, jun., of Melbourne, has under treatment for some skin affection a lady upon whom

I performed Loreta's operation for benign stricture of the pylorus about eight years ago. On examining her lately she informed me that her alimentary tract had never given her any uneasiness since, and she seemed in excellent health. This, though only a single case, helps to defend the operation from the stigma of not being permanent in its effect; and I must say, from my experience of the ease with which it can be performed, with the immediate relief it gives, and its apparent safety, I should feel tempted to give it a trial in all cases of innocent contraction of the pylorus. While writing this address I noticed in the *Lancet* a suggestion of Professor Ogston, of Aberdeen, for the treatment of innocent stricture of the pylorus. It consists in the introduction into the patient's stomach of gutta-percha balls, which being coated with sugar are easily swallowed. Having gauged the diameter of the pylorus, the balls are gradually increased in size until the dilatation has been effected to the required extent. The process is slow; in one case it took 810 days to complete.

Some months ago I had the pleasure of exhibiting, at a meeting of the Victorian Branch of the British Medical Association, twenty cases of hysterectomy for fibro-myoma of the uterus, in which I adopted the extra-peritoneal method for the treatment of the stump; and I here reiterate the opinion I then expressed in favour of that method. The chief advantages I claim for it are—rapidity and simplicity of operation (a matter of no small moment when the patient has been weakened by previous hæmorrhages), and the fact that the roof of the vagina is left in its natural condition, and statistics prove that the mortality is less than by the intra-peritoneal method I lost none of my twenty cases, but one out of three subsequent cases succumbed through hæmorrhage, caused by the breaking of the wire surrounding the stump twenty-four hours after operation.

About five years ago, at the request of Dr. Barclay Thomson, my corresponding physician at the Alfred Hospital, I cut down upon a perforated typhoid ulcer. The edges of the tear having been brought together, the abdomen was thoroughly cleansed, and three days subsequently the patient died from pneumonia. I must say that I consider the operation perfectly feasible and justifiable in cases where the lesion has been discovered early, and where the initial shock is not too severe to contra-indicate operative interference. The method I should now recommend in such a case would be the grafting of a piece of omentum over the rent rather than any attempt at approximation of the unhealthy edges by suture. It is encouraging to note that successful cases are reported by Drs. Long Fox, Tweedie, Todd, and Van Hook. The surgical treatment of perforating gastric ulcer is also an accomplished fact.

The technique of the peritoneal toilette has not undergone any material change within the last year or two. But I am glad to see that indiscriminate flushings are now generally condemned. I rely upon strict asepsis, and simply remove the *débris* with soft sponges, flushing only in cases where I have reason to suspect the intrusion of septic matter from the field of operation.

I cannot speak too highly of the Trendelenburg position for most cases of intra-pelvic surgery. The raising of the pelvis naturally causes the intestines to gravitate towards the diaphragm, and thus affords a much better view of the pelvic contents than could otherwise be obtained. Another obvious advantage is that the intestines can be kept within the abdominal cavity during the performance of an operation.

Two minor details in cœliotomy that have given rise to discussion are—the incision through the abdominal wall, and the subsequent suturing.

Having seen so many cases of ventral hernia result from taking the route through the linea alba, I now invariably make my incision through the rectus muscle, with the result that I seldom find hernia following my abdominal sections. Although several eminent authorities advocate suture of the abdominal tissue layer by layer, the results I have obtained by a single row of stout silver wire sutures passing through all the tissues are such as to induce me to adhere to that method.

In concluding my remarks upon these few points in abdominal surgery, I take this opportunity to allude to the strictures passed by Sir William Priestley on the tendency to over-operate in gynæcology. There is no doubt that, along with the great improvements in the methods of operating in this specialty, there has been a large increase in the number of operations performed ; at the same time I think that, as the majority of gynæcologists are reputable men, outbursts of this kind can serve no useful purpose, and only tend to bring unmerited opprobrium on the profession at large—a result which, I am sure, no one would regret more than Sir William Priestley himself.

Most of the innovations in Surgery to which I have referred are the outcome of the labours of European and American workers, but the surgeons of Australasia have contributed something to the general progress. Some years ago, as you are all aware, Mr. T. N. FitzGerald, of Melbourne, astonished us with the results of his talipes operation, and followed this up with a most ingenious method for the cure of cleft palate. More recently he crowned his brilliant successes by the introduction of the subcutaneous operation of wiring fractured patella, by his operation for vesico-vaginal fistula, and by the treatment of inflamed bones by drilling. These are, indeed, the conceptions of a master-mind, and ought to ensure for him a lasting renown.

Of the late Widenham Maunsell's work I have already spoken, and it is to be regretted that he was not spared to see his operations for enterectomy, hysterectomy, and cleft palate gain the reputation which they have acquired since his death.

In the treatment of torticollis, Dr. Gardner has achieved most satisfactory results by his ingenious method of combining resection of the upper cervical nerves with the division of the spinal accessory nerve.

To Mr. Twynam, of Sydney, is due, I think, the credit of having devised the method of treating recent fractures of the patella by tiring, and a very useful operation it undoubtedly is in those cases where the fragments can be brought easily into apposition. But the opinion I have formed as the result of my own experience is that the open method of wiring the fragments is to be preferred.

Dr. Pinnock, of Ballarat, has proposed and carried out with success an operation for the relief of large ventral herniæ. In these days of frequent abdominal section, cases of ventral hernia are sure to present themselves now and then, and I cordially endorse Dr. Pinnock's treatment as a rational and sound method.

Hydatid disease appears to be on the increase in these colonies, and no part of the body is exempt from it. In my practice I have removed cysts from the brain, orbit, lung, liver, omentum, Fallopian tube, uterus, bones, and joints, and I am aware that many of you here to-day have had similar experiences. We would hail, therefore, any innovation in the treatment, in which simplicity in the performance would be associated with safety and rapid convalescence. Up to the present time Lindemann's operation has been regarded as the safest and most efficient, and so far as the treatment of suppurating cysts is concerned is likely to be generally used. Mr. Hamilton Russell, of Melbourne, published recently his operation, wherein after evacuating the contents of the fibrous capsule or pseudo-cyst he allows it to drop back and stitches up the superficial structures. The method has been strongly advocated by such conscientious workers as Messrs. Syme and Ryan, of the Melbourne Hospital, and in their hands has met with no small measure of success. At the same time I must confess that I should feel reluctant to adopt the treatment in hepatic or pulmonary hydatid. In the former I should fear the possible ill-effects of the great secretion of bile, which so often takes place when the mother-cyst has been withdrawn. To give an instance of the danger in lung hydatid, I may quote the following case which occurred in my own practice only a few days ago, and in the presence of Mr. Hamilton Russell, who was assisting me:—Having removed a hydatid from the right lung through the second interspace anteriorly, following out the directions of the inventor, I brought the skin edges together with sutures. On the removal of the cyst, the patient was seized with a violent fit of coughing, and this probably ruptured a small bronchus, an immediate pneumo-thorax resulting, and then a condition which alarmed me. A rapid, general emphysema took place, the patient being blown out to a most extraordinary extent; the areolar tissue being enormously distended from the infra-orbital region to the scrotum, at the same time urgent dyspnœa with cyanosis occurred, and the state of the patient was so serious that I was obliged to open up the wound and introduce a drainage-tube, which immediately relieved the condition. Nevertheless, there are many cases of sterile cysts in other parts of the body, as the omentum, in which the operation ought to be preferred to any other.

Mr. Kent Hughes, of Melbourne, claims priority for his operation for the treatment of talipes equinovarus, which consists of the removal of a portion of the astragalus and os calcis, with of course the usual tenotomy. With Mr. Hughes's assistance, I have performed this operation in a very severe case, and the result was eminently satisfactory.

At the last Medical Congress Messrs. Syme and Cherry, of the Melbourne University, brought forward the result of their method of dealing with ganglia, and the fact that their treatment is now generally adopted is sufficient proof that the value of the operation is recognised.

In the *British Medical Journal* for September, 1893, I published an operation for the radical cure of inguinal hernia, and gave the results of sixty consecutive successful cases. I have now a record of one hundred and fifty consecutive successful cases, and only six relapses have come under my notice. As the steps of this operation have been fully described in the principal European and American journals, I will not occupy your time with them. But it is a great satisfaction to me to know that the operation has been widely adopted in England and America.

And now, gentlemen, allow me to thank you for the kindly manner in which you have received this address. Much of the matter will not be new to you, and I make no pretension to come before you to-day in any other capacity than that of a practical surgeon. The comments made upon the work of others are only the outcome of the experience gained by me in carrying out the methods that I have criticised. The outlook for the science of surgery is indeed a hopeful one, and I trust that the very valuable work that we are promised in this section will not alone prove interesting to us, but will show to our fellow-workers in older countries that we are following their example in upholding the good name and dignity of our honourable profession.

PARTIAL THYROIDECTOMY.

By ALBERT MARTIN, M.D. LOND.

The following series of fifteen cases of thyroidectomy I beg to bring to your notice as exemplifying, first, the pathological conditions encountered, and the surgical procedure adopted for their removal. In all but one—a case of exophthalmic goitre—the cogent reason for operating was the presence of obstructive interference with respiration. By that I mean direct pressure symptoms which to a degree prevailed in the case of exophthalmic goitre. In all, the ages of the patients ranged from 14 to 25, and, with one exception, they were all females.

Two of the severest cases were due to the presence of numerous blood cysts, stretching on either side of the neck, and at the upper part separated from any thyroid tissue, giving one the idea that they were probably transformed glands, as many as twelve on one side and sixteen on the other being taken from the case, of which I have drawings before, and a photo. after the operation.

During life the contents were very fluid, and aspiration was attempted to evacuate the cysts, a procedure I would strongly condemn, because no sooner were the contents withdrawn and the needle taken out, than very active hæmorrhage took place, causing the tumour to swell to twice its original size, with leakage through the puncture, necessitating its being closed by tying, after which it was found to be easily enucleated from its bed by the finger, without any further hæmorrhage.

Another example of the cystic variety is a large central one, containing pus within a firm fibrous envelope. This, during life, has produced no constitutional symptoms, and extirpation seemed to comprise the whole organ, so as much of it as appeared healthy was excised and replaced in the incision before closure.

Of the other cases, although the situations differed—two being attached to the isthmus—they can be subdivided into two classes, one being a normal increase of thyroidal tissue, and the other being an enormous increase in the vascularity (principally venous) of the organ. The former of these presents little difficulty from a surgical point of view; but the latter requires the greatest care in operation, by reason of the hæmorrhage likely to occur on too free use of the knife. To this class belonged the case of exophthalmic goitre, and, in common with the others, it presented a symptom of some diagnostic importance. I refer to the alteration in the size of the gland during the administration of the anæsthetic. Whenever there is any great swelling of the tumour, especially in the anterior triangles of the neck, whenever there is any obstruction to the respiration, you may feel sure you are dealing with an excessive increase in the vascularity of the organ, and, fearing hæmorrhage in such case, I strongly advise the previous preparation of a saline solution for injection, according to the method of Arbuthnot Lane.

Bearing in mind the varied condition to be met, and the fact that the pathological conditions are not always manifest, the operation does not call for a detailed description.

In all cases I would advise as free incision over the whole length of the tumour, following the line of the sternomastoid through platysma to superficial fascia. Slitting this up on a director, the superficial muscles of the larynx thinned and expanded will next be torn asunder, and the deep facia similarly treated, always getting at the outside limits first. If the tumour is then found to be central and separate, the incision can be extended laterally across to the other attachment of the sternomastoid muscles, and then discarding the scalpel the attachments can be torn asunder and tied seriatim, while holding the two ends in forceps.

Should the structures require division after ligature a pair of scissors will suffice. Thus this method is proceeded with from the sternal notch, and laterally upwards along the outer border of the tumour until the whole is raised inwards over the trachea. To facilitate this movement a stout piece of tape can be lightly drawn around the exposed part of the tumour, and by a series of double ligatures, by means of an aneurism needle, severed from its attachments and the isthmus. The resultant gap is stuffed with iodoform gauze, and the sutures introduced, which are tightened on the next dressing.

For the first two or three days, according to the amount of hæmorrhage, I keep the patient in a position which might be termed a modification of Trendelenburg, in which all head pillows are dispensed with; but one placed under the lower ribs and small of the back, and the foot of the bed raised eight inches, thus preventing any anterior mediastinal suppuration or masked hæmorrhage in that quarter.

In conclusion, I must bear witness to the efficient aid received from Drs. Ewart and James, the latter of whom gave valuable assistance in a severe case of hæmorrhage, where, misled by the hope of finding a central cyst, an attempt at its removal by an anterior incision and working from within outwards had to be discarded for the method I have brought to your notice. In this case it was necessary to clamp the bleeding points for forty-eight hours, and resort to a free application of tannic acid and turpentine; a procedure to be mentioned as one to be avoided whenever possible.

THYROIDECTOMY IN GRAVES'S DISEASE.

By J. O. Closs, M.D., Ch.M. Edin., Dunedin.

I purpose bringing under notice in this paper some of the results that I have obtained by performing thyroidectomy in subjects of Graves's disease.

At the very outset one is met with the question, What are the salient points of this disease that call for the necessity of performing so grave and important an operation? The answer is found in the results of recent pathological researches on this subject by Professors Greenfield, Eulenburg, Reinhold, and others, strongly supporting the doctrine of Mobius, that this disease is due to the toxic effects of the perturbed action of the thyroid gland, whether the gland is enlarged or not.

This latter condition of the gland would not in itself (in some cases, at least) give rise to operative interference, were it not for the concomitant symptoms of a pronounced and important type that are associated with this disease, such as tachycardia, hypersensitiveness, and general derangement of the nervous system, and probably exophthalmos. These symptoms forming the cardinal points of the disease, call urgently for some relief.

The investigators already mentioned, considering the altered condition of the thyroid gland, the *fons et origo* of all the trouble, invoked the aid of the surgeon rather than the physician to ameliorate the evil by removing a portion of the gland.

It is not within the province of this paper to discuss the causal relations of the pathological conditions of the gland in Graves's disease, most interesting as they are. At the Medical Society in October, 1893, Mr. Maude, in a paper which he read before the members entitled, "Some less known factors of Graves's disease," mentioned that he had collected twenty cases on which thyroidectomy had been performed, and that the operation had nearly always relieved the symptoms.

Full statistics, however, are wanting both as to the actual results in each case, as well as to the amount of gland removed. In about a month afterwards, Greenfield followed with the Bradshaw lectures, taking as his text "Changes in the thyroid gland in Graves's disease," in which he pronounced himself a strong advocate in favour of operating on the gland itself.

While I wish to confine myself to those cases in which thyroidectomy was performed for pronounced and undisputed symptoms of Graves's disease, I would first of all mention one on whom the operation at the time was performed more for pressure symptoms than anything else ; but it is one of that type that some investigators maintain as a case of enlarged thyroid precursory to Graves's disease, and was certainly one that would favour such a view. A female, aged 29, married, first noticed the gland beginning to swell between two and three years ago, and what is a point of importance as advanced by the same theorists as one of the less known factors in Graves's disease—namely, that the gland frequently varied in size, but on the whole steadily increased until it was of very large dimensions, the right lobe larger than the left. She was admitted to the hospital on September 20, and carefully watched, her pulse varying between 90 and 100. There were distinct symptoms of hypersensitiveness, and she complained that at times her vision was defective, and when walking about felt her eyes as if they were becoming larger. This case is interesting, for I think it may be safe to say that she had at the least two, if not three, of the cardinal symptoms of Graves's disease in the initiatory stage.

Thyroidectomy was performed on September 26, 1894. The whole of the right half of the gland was removed, it was very large, and exhibited the usual glandular hyperplasia. She made an uninterrupted recovery, and was able to sit up on the twelfth day.

Her pulse, which was over 90 previous to operation, now varied between 70 and 78. She was certainly less nervous and more contented. She left the hospital one month from date of operation, feeling perfectly well, and still continues so. I have not cited this case as one of true Graves's disease, but merely one as an example of the theory set forth by some, that the enlargement of the gland precedes the other symptoms. Nevertheless, as I have said before, she did possess some of the symptoms of Graves's disease, which I took to be in their initiatory stage.

The next case I wish to draw your attention to is one in which the symptoms of this disease were most distinctly marked—especially the exophthalmos, the tachycardia and general nervousness. The patient was a female, 28 years of age ; unmarried ; lived mostly in the country ; always enjoyed very fair health up till about four years ago, when she noticed that the thyroid gland was enlarging. This, it appears, followed an attack of anaemia, for which she had been medically treated. Most practitioners will agree that an enlarged condition of the thyroid is not uncommon amongst anaemic girls, which yields in many cases to ordinary treatment, leaving no deleterious effect. Four months previous to the patient's admission to the hospital the gland increased rapidly in size, pulsation was visible in her neck, and her eyes gradually assumed the exophthalmos condition. Accompanying these physical signs were frequent attacks of diarrhoea, profuse sweating, severe headaches, a choking sensation, and a feeling of unrest and nervousness. When admitted to the hospital she was kept under observation for a few days. The exophthalmos was well marked, the pulse ran about 150 to the minute, temperature normal. Thyroidectomy was performed on the 14th of last May, or close on nine months ago. The whole of the right half of the gland was removed. Three hours after the operation the temperature rose to 101, with an increase in the pulse rate. This, I consider, was due to an increase in the thyroid toxæmia. Twenty-four hours after operation the temperature was 100 and pulse 120—a decided decrease in the tachycardia. Two days later the pulse had fallen to 83 per minute, with temperature at normal, and with slight variations remained so, the patient leaving the hospital sixteen days from date of operation. During this time the exophthalmos had wonderfully diminished, and she had lost the restlessness, and the general nervous symptoms which she so markedly exhibited prior to the operation. Since then I have seen her frequently. She enjoys excellent health, and I can testify to the total absence of any of the symptoms of Graves's disease.

The next case I wish to bring before you does not present the same symptoms in such a marked degree as the one just described, yet, withal, a true case of Graves's disease. This one is also a female, age 19, unmarried. She says that two years ago she began to be troubled with palpitation of the heart, and feeling of weakness, and after a few months these symptoms were followed by a swelling at the root of the neck. It is well to observe the sequence of symptoms in this case and the next one, as compared with the preceding two. The swelling continued to enlarge, and in six months began to interfere with her breathing.

About six months after this, and about a year previous to her admission to the hospital, she got a fright, after which all her symptoms increased. She became very nervous, suffered severely from flushings and sweats, headache, amenorrhœa, occasional attacks of diarrhœa, a dread of suffocation, and palpitation of the heart.

She was admitted to the hospital on the 14th August last year. All the symptoms already mentioned were in evidence. There was very little exophthalmos. The eyelids followed the movements of the eyeballs downwards, but in a jerky manner. Pulsation over the carotids was visible. The gland was uniformly enlarged, except that it was a little more prominent immediately to the right of the middle line. Pulse rate, 120 per minute; temperature, sub-normal; frequent attacks of dyspnæa.

Ten days after admission to the hospital, thyroidectomy was performed. The whole of the right half of the gland was removed, and this proved to be of larger dimensions than was previously supposed. Eight hours after operation the temperature was 101, and fluctuated between that and 100 for the following twenty-four hours, while the pulse varied from 122 to 140 per minute. The respirations varied from 31 to 38 per minute. I forgot to mention this fact in connection with the other cases—that the respirations increased in number with the increase of temperature and tachycardia during the first twenty-four hours after the operation. There was also a noticeable increase in the nervous symptoms. The general restlessness would at times give place to violent starts, with attempts to get out of bed.

Four days after the operation the temperature was normal, and the pulse 84. She continued to improve, and left the hospital three weeks from date of operation. Since then I have seen the patient several times, and although she is still somewhat nervous, she is vastly improved in her general health.

I will only trouble you with one other case—a very interesting one, although it had a fatal termination. This case was also a female, age 27, married, was admitted to the hospital on the 19th of last September. The most noticeable signs on looking at the patient were the protruding eyes, the hypersensitiveness, pulsation in the neck, with the enlarged thyroid. She exhibited distinct psychological disturbances, especially in the department of memory. Her history was that she enjoyed very good health up till three and a-half years ago, when she began to suffer from palpitation of the heart, weakness and rapid breathing. Any enlargement of the gland was not noticed till six months after this, and synchronously with that was noticed that the eyes were becoming more prominent. She affirmed, too, that at times they were alternately larger and smaller. The sequence of symptoms in this case corresponded very much with the one just preceding, and clearly indicates the presence of the disease in the constitution for some months before either the gland or the eyes gave any evidence of its existence.

Thyroidectomy was performed on October 23, 1895. The whole of the right half of the gland was removed. The operation was a difficult one, on account of the largeness of the gland, extending deeply backwards, and wrapping round the trachea, the fierce pulsation in the vessels of the neck, and the rapid breathing, a wide and vascular base.

No collapse followed the operation, and she left the table with apparently as good chances of recovery as any of her predecessors. The operation was completed about 4 p.m., and she exhibited no unusual symptoms till 9 p.m. when her temperature suddenly shot up to 103·2, with the pulse going at a tremendous rate, I should say not less than 200 to the minute. She was wildly delirious, and full of hallucinations, and had to be restrained in bed; her respirations were extremely rapid, and everything at a fearful tension. A hypodermic injection of digitaline was procured, but before it could be administered she suddenly expired, the cause of death being thyroid toxæmia.

Looking at this disease from a purely clinical standpoint I don't think any apology is necessary for the attention I have given to its symptoms. To the surgeon who would operate for its relief or cure the symptoms are of the utmost importance, not only from their gravity, but their sequence, as can easily be inferred from what has already been said in regard to them.

It must never be lost sight of, that the operation is not undertaken on account of the enlarged thyroid, but with the object of removing a portion of the gland to cure Graves's disease, and we know from clinical experience that the theory advanced by Greenfield and others, that the physio-pathological changes in the gland itself can lay the foundation of this disease in the constitution without the gland in any way assuming undue proportions that will render it capable of physical diagnosis. If it so becomes possible to diagnose Graves's disease in its early stages, in these cases of delayed enlargement of the thyroid, the surgeon will have no hesitation in cutting down and removing a portion of the offending body, even though it may not be appreciably enlarged.

Such an operation must necessarily follow, if we have taken the Mobian doctrine to be the correct one, and so far as investigations have gone we have every reason for belief in it.

With regard to the operation itself, it would appear that it is of too recent date for anything like reliable and complete statistics to be published; but we do know from very reliable sources that it has proved a great success in either relieving or curing many of the patients that have submitted to this form of treatment. Putman has collected fifty-one cases, with three deaths; all the rest cured or relieved. Professor Marie has said that he has seen a certain number of the subjects of Graves's disease die a miserable death; and in the presence of such a disease, having such grave symptoms, I shall no longer hesitate to advise a surgical operation, the results of which have been shown to be favourable in eighty per cent. of the cases in which it has been performed.

One word or two regarding the technique of the operation, and I have finished.

The incision to be adopted must depend on the size and shape as well as the amount of gland to be removed; and I am of opinion that the transverse crescentic incision, or some modification of it, will be found to be the best: it gives more room than the vertical, and there is not the same cicatriced contraction, which proves a source of annoyance in backward movements of the head. The portion of gland to be removed is generally the right half; this half, as far as my experience goes, and as far as I can learn, is generally the larger of the two. I think a good deal might be said as to whether the removal of the isthmus would be sufficient in Graves's disease; but this operation does not seem to be favourably entertained, as it has been usual with most surgeons to remove one half. When pressure symptoms are present, I consider nothing less sufficient. As regards the presence of a middle lobe, I think it is extremely rare; at any rate, I have never seen one, but I have seen it several times simulated by the anterior margin of the right lobe overlapping the trachea.

With regard to the method of removal of one half of the gland, I consider the removal *en masse* superior to that of enucleation.

In the former, with free use of ligatures, the surgeon can see every piece of tissue he divides, and what is of great importance he can easily search for, and preserve the recurrent laryngeal from injury.

In the latter method — enucleation — there must be considerable hæmorrhage, and as the thyroid vessels must in any case be secured, I can see no advantage in it—not even in speed,—while the nerve is not secure from injury. Mickulcz's method of leaving the posterior half in its capsule is open to the same objections, and if operating for Graves's disease, increasing the risk of thyroid intoxication, and for this reason I would advocate that as little as possible of thyroid tissue be included in the ligature at the base. Whatever method may be adopted, all the usual minutiæ and technique appertaining to this operation must be strictly adhered to, it is one that will allow of no slovenliness, if such a thing can be allowed in surgery at all. Neither do I think there can be any rule laid down to guide one in this operation. The only good rule for the surgeon is to have a thorough knowledge of the parts he is working in, and follow the path of least resistance. But with all this, in some cases of Graves's disease, he will find his resources taxed to the utmost. What with the heart beat at 150 or more, rapid respirations, and the great vessels of the neck throbbing and straining, the operator, as some one has said, is apt to be impressed with the notion that immediate destruction is at hand.

The after-treatment calls for no particular note, other than what is usually adopted. There is always a hypersecretion of mucus in the trachea, giving rise to a troublesome cough, which is one reason why the vessels should be well secured, for fear of secondary hemorrhage.

With regard to the time at which an operation for Graves's disease should be performed, sufficient has already been said to indicate the sooner it is done the better for all concerned, for there is a stage of the disease which, if passed, operative measures would probably be of no avail, and would serve the purpose better if left alone.

I would, therefore, urge the physician to early recognise that Graves's disease is one for surgical treatment, and not to delay till his therapeutics have been exhausted, and the case become so bad that both surgeon and patient are handicapped in a contest that can, in all probability, have but one ending.

On the other hand, if early recognition of this disease should become the rule, and be acted upon accordingly, who will deny but that within the next few years, surgery will have done more for its relief or cure than all the therapeutics discovered either before or since the honoured name of Graves was associated with it.

In the course of a general discussion which followed the reading of these two papers Dr. H. C. Gards, Queensland, said that in one case in which he removed the thyroid gland, there were two points of interest which did not occur in the cases mentioned by Drs. Martin and Closs—viz., the age of the patient, and secondly, pain caused by the pressure on recurrent laryngeal nerve. Thirty-two years was the maximum mentioned by the two previous speakers, while the age of the woman operated upon by him was sixty-two, the thyroid was not large, but was intimately connected to the trachea, and on removal was found to contain a number of bony plates. She made a rapid recovery, and has remained up to the present free from the cervical pain and difficulty of breathing.

SMALL HERNIÆ IN THE LINEA ALBA:

A Frequently Unrecognised Cause of Chronic Dyspepsia.

By George Cleghorn, M.D. Durh., M.R.C.S., Blenheim, New Zealand.

On 22nd September, 1894, Mrs. G., aged 32, a multipara, consulted me, as she was suffering from attacks of severe pain in the epigastrium, accompanied by vomiting, which usually came on shortly after eating. The duration of these attacks varied much. Sometimes they lasted only a few minutes, and at other times they persisted for hours; but relief always came suddenly, and was accompanied by gurgling, and a feeling as if some swelling had subsided. The attacks occurred much less frequently when the patient was confined to bed, and the only drug that appeared to give relief was opium, administered shortly before meals.

These attacks had first occurred three years previously, towards the end of a pregnancy, during which she had not suffered more than usually from sickness. Her family history was very good. As a girl she had suffered for some time from anæmia, and had had symptoms of gastric ulcer. She was still somewhat anæmic, for which she was treated by iron ; and the uterus, which was found to be enlarged, anteflexed and tender, was curetted, and the metritis cured.

As the attacks still continued, and as the symptoms pointed to some obstruction, probably caused by adhesions, an exploratory operation was performed on 23rd October, 1894.

An incision three inches long was made from a little below the sternum in the linea alba ; and as the knife was separating the recti, the point was found to enter a tiny pouch about two inches below the end of the sternum. In diameter this pouch did not exceed the one-sixth of an inch, and enclosed in, and adherent to it was a small piece of omentum. The tiny sac and its enclosed omentum were excised, and the wound carefully closed by a continuous catgut suture in layers for the deeper tissues, and interrupted silkworm gut sutures for the skin. The recovery was uneventful, and the symptoms were relieved.

On 12th November, 1894, F. C., male, aged 23, a labourer, with a good family and personal history, consulted me. Two years previously, whilst ploughing, he had been thrown violently against the handles of the plough, and since then had become subject to attacks of severe pain in the epigastrium, sometimes accompanied by vomiting. These attacks generally came on shortly after eating, and were occasionally induced by riding or violent exercise. Their duration was variable, and they always terminated suddenly.

He had been treated by various medical men, but prescriptions containing opium were the only ones that gave relief. On careful examination a small hernia, the size of a very small pea, was discovered in the middle line about one and a-half inches above the umbilicus. This was treated as in the last case, and the symptoms disappeared.

At the time these cases were under treatment I could find nothing in the text books or current literature within my reach bearing on the subject of these minute herniæ, but some months later, Dr. Davies, in the "Annals of Surgery" for April, 1895, described an almost similar case, on which he had operated on January 2, 1895, more than two months after my first case.

He also refers to the dearth of reference to this condition in surgical literature, but mentions that Bergmann referred in a clinical lecture during the previous winter to more than a dozen cases where specialists in Berlin and Paris had diagnosed gastritis, ulcer or cancer of the stomach, and in which small hernia in the linea alba had been found, and treated with relief in every case.

Koenig also, in the last edition of his "Surgery," states that the characteristic ruptures which evoke suffering in the stomach regularly have a small mass of omentum in the sac, so that it cannot slip back on account of the narrow neck, or because a strip of omentum has become adherent in the sac. In the cases in which he could follow it, this piece of omentum passed to the greater curvature of the stomach, so that when the stomach was moved the band of omentum was dragged upon, and only by a complete severance of this band could the symptoms be relieved. In my two cases I did not attempt to trace these bands to the stomach, but I think it was probable that this was the condition present.

Championniere, in the transactions of the French Congress of Surgery, 1894, reports eleven cases of epigastric hernia operated on by him. He refers to the small size of these herniæ, and the severe distress accompanying them.

Palliative measures had little to offer, in only one case did a bandage afford any relief. In my cases I have found that pressure in this region is difficult to apply, and is not easily tolerated. He obtained good results in all his cases.

After my accidental discovery of this condition in my first case I have carefully examined all my patients suffering from chronic dyspepsia, and have come across five others in which small hernial openings existed in the linea alba, but they differed from the condition found in these two cases in that they could be entirely returned, though pressure on the opening, even after the hernia was returned, was always painful.

The behaviour of these small herniæ in this position, in not tending to increase in size, is in marked contrast to that of those in the umbilical opening and below it. In the few cases I have seen the position in the linea alba at which the hernia appeared varied. In two cases there were two hernial openings. I have had under observation for years some cases where larger herniæ, varying from half an inch to one inch in diameter, existed ; these have not been accompanied by symptoms, but resembled the more minute ones in their tendency not to increase in size.

The object of this paper will have been attained if it helps to draw attention to the fact that in obstinate cases of dyspepsia it is necessary to look for these little herniæ.

CASE OF FÆCAL FISTULA TREATED BY RESECTION WITH MURPHY'S BUTTON.

By Dr. J. H. Townsend.

Hon. Consulting Physician, Christchurch Hospital.

The following case is of interest as showing the cure of an intractable case of fæcal fistula by resection, after failure by other methods, it being the first recorded recovery in New Zealand, and, so far as I know, in Australia, of resection by Murphy's button.

The patient, L. B., aged 39 years, states that she inherited a delicate constitution from her maternal grandparent, and has had many illnesses of the tubercular type in childhood, and of a neuralgic type ever since. She derived much benefit from section of an intercostal nerve in the cardiac area, which was performed ten years ago at Napier by Drs. Spencer, Menzies, and De Lisle, and she continued to improve till six years ago, when constant hiccough set in, accompanied by retching of blood. This lasted five months, and for its relief the left ovary was removed, with temporary benefit. As, however, the hiccough and retching returned after an interval of some months, a second operation was performed in the Christchurch Hospital, with the view of removing the remaining ovary on the right side. The ovary could not be found, and, after a further interval of a few months, a third operation was performed for the same purpose. This was equally unsuccessful, either owing to the adhesions or to the congenital absence of the right ovary. The difficulty of breaking through the adhesions probably injured the intestines, and a fæcal fistula followed. As many as seven plastic operations were performed to close the fistula, without success.

It was at this stage that the patient came under my care, and on the 17th October, 1895, I operated. The fistula was situated in the linea alba, about two inches above the pubes. It was surrounded by an elliptical zone of eczematous skin, having a very irritable, unhealthy appearance. Although partial evacuation occurred regularly by the rectum, a considerable proportion of the fæces passed through the fistula, so that although the lower segment of bowel was evidently pervious, much doubt existed as to the degree of constriction, some cases being reported in which the lower segment scarcely admits an ordinary catheter. I made an elliptical incision to remove the principal portion of the eczematous skin with the fistula in the centre. I then dissected down, following the fistulous tract to the bowel, which was matted to the surrounding coils of intestine in apparently inextricable confusion. It required hours of careful dissection to release the perforated loop of intestine; and the hæmorrhage was very difficult to control, owing to the vascularity of the adhesions.

The intestine having been previously cleared of its contents, Makin's clamps were placed two inches above and below the fistula. The bowel was then divided one inch to the inner side of each clamp, and a triangular portion of mesentery with two inches of intestine, with the fistulous opening in the centre, were removed; the base of the triangle of the mesentery being at the intestine, but slightly narrower than the length of bowel removed. A purse-string suture was then applied to one end of the divided bowel, as advised by Dr. Murphy. The stem of the button was then inserted and the purse-string drawn tightly round its stem, so as to gather up the cut edges of intestines within the clasps; the other half of the button was then inserted in the opposite end of the intestine, and the two parts of the button pressed together. The mesentery was carefully brought together by a continuous suture—both before and behind, and the intestines were then returned in parallel lines, especially at the seat of approximation. The size of the button was No. 3—25 millimetres in diameter.

The bowel was thoroughly flushed with normal saline solution, at 100 degrees Fahr., until all bleeding ceased; a drainage tube was introduced, and the wound closed and dressed.

Although the operation was very tedious, lasting two hours fifty minutes, the patient rallied in good spirits after it, there being no abnormal temperature or faintness. Sickness commenced at 4 p.m., within an hour of the operation, and recurred every half or three-quarter hour until midnight. Attacks of pain commenced at 7.30 p.m., and returned about every hour. The patient slept a little at 10.50, and at midnight she was given sips of hot water, or barley water every half-hour.

October 18 (2nd day).—Sickness occurred at intervals of from one to two and a-half hours. Pain returned at intervals of from two to three hours; and sleep occurred every three or four hours. She was fed every hour with either hot water, barley water, mutton tea, lemonade, or soda-water. Hot fomentations were occasionally used.

October 19.—Sickness occurred every one or two hours; pain about once every four hours; and sleep was less frequent than yesterday. The diet was restricted to hot water every hour, and one hot water enema; two seidlitz powders were given, and hot fomentations applied.

October 20.—Sickness occurred every two or three hours from midnight to midday, but not at all afterwards. The bowels acted five times; pain was once complained of, and sleep occurred at intervals of three or four hours. The diet consisted of sodawater, barley water, chicken tea, and a little whisky and water. Two seidlitz powders were given, of which the first was vomited.

October 21.—No sickness to-day. The bowels acted four times. Pain was complained of once only, and sleep was more continuous. The diet was the same as yesterday, with the addition of gruel. A seidlitz was given this morning.

October 22.—No sickness; four stools; pain occurred in the early morning, and she slept at intervals. The diet was chicken tea, barley water, and lemon, and whisky and water. One seidlitz powder was given.

October 23.—No sickness; three stools; no pain; slept well. The diet was the same as yesterday, with the addition of gruel. Two seidlitz powders were given.

October 24.—No sickness; three stools; pain occurred in the early morning; less sleep; diet the same with the addition of tea and soup.

October 25.—Three stools; pain early this morning; same diet with the addition of jelly; one seidlitz.

October 26.—Four stools; three powders. Hydrargyrum cum creta and soda.

October 27.—Three stools; one powder. Hydrargyrum cum creta and soda.

October 28.—Three stools; two powders. Hydrargyrum cum creta and soda.

October 29.—Patient was removed to Rhodes' Convalescent Home.

November 1.—The button passed to-day without any inconvenience, and the patient feels quite well.

TEMPERATURE.—The temperature rose to 101·8 deg. on the day after the operation, and then gradually receded to 100 deg. during the first week, and 99 deg. during the second week. The daily range was during the first week, 2 deg., and during the second week 1 deg. higher at 4 p.m. than at 4 a.m. There were no septic indications.

PULSE.—The pulse remained high for the first fortnight, ranging from 110 to 120, and during convalescence fell to 90; and at the end of the third week became normal.

REMARKS.—The chief difficulty in this operation consisted in separating adhesion without injury to the bowel, and isolating the fistulous coil of intestine. The mesenteric vessels were enlarged, and the hæmorrhage difficult to control. I have to acknowledge the kind assistance rendered during the operation by Mrs. Thomas Cockrane Brown, and Dr. W. H. Symes for his careful administration of the anæsthetic.

A CASE OF STRANGULATED HERNIA, COMPLICATED WITH INTERNAL OBSTRUCTION.

BY F. BOWE, M.R.C.S. ENG., Timaru.

A. G., aged 29 years, was admitted into the Timaru Hospital on the afternoon of 17th September with a strangulated left inguinal hernia, which had been down since 7 o'clock that morning. As taxis had no result, he was operated on soon after admission. The sac was opened, and contained a large knuckle of bowel, but no omentum. After incision of the neck of the sac I returned the bowel into the abdomen, but it did not go up with the usual slip, and remained close to the internal ring, from which it could not be pushed away. Both Dr. Hogg, who was assisting me in the operation, and I came to the conclusion that there were internal adhesions, but determined that nothing more need be done for the present. The external ring was closed with two wire sutures.

September 18.—Slept two and a-half hours after a morphia suppository; had a good deal of pain; vomited 10 ounces of bile. Pulse, 68; temperature, normal at 10 a.m.

September 19.—Vomited some more bile last night; suffered from pain for an hour and a-half. Pulse, 80; temperature, 99.

September 20.—Had no pain last night, and no vomiting; has taken nourishment well. Pulse, 74; temperature, 98·8.

During these three days he was generally free from pain and comfortable during the daytime.

September 21.—Had a very quiet night; vomited some bile in the early part of the night after taking some milk; after that he took 8 ounces of milk and barley water. Pulse, 68; temperature, 98·6.

The sutures were removed, the wound healing by first intention.

During the day the patient declared he would just as soon die as live, and refused his food, and had to be fed through the nose with beef tea. This was repeated twice during the day, and after that there was no more trouble on that point. He was reputed to have been eccentric for a number of years, living a solitary life by himself, and suffering from a mild form of religious mania.

September 22. Had pain in the abdomen for an hour and a-half; slept after a morphia suppository; vomited 4 ounces of greenish fluid; took and retained 24 ounces of milk and barley water.

September 23.—Had severe pain from 8 p.m. to midnight; did not sleep until 3 a.m.; took 16 ounces of milk and 6 ounces of beef tea.

September 24.—Had a good deal of pain again last night; vomited a greenish fluid twice, and took 18 ounces of milk; only slept two hours. Pulse, 108; temperature, 98·4.

During the day he had an enema of soap and water, which resulted in a scanty motion.

September 25.—Vomited brownish fluid several times in the night, a small portion of which was offensive; took 8 ounces of milk, but it all returned; did not complain of pain but of feeling weak. Pulse, 108; temperature, 98·4. Has had another enema in the early morning which had no effect. There is considerable distension of the abdomen this morning, although this symptom has been absent previously. After washing out the stomach abdominal section was performed the same afternoon in the middle line. The bowel was found to be firmly adherent to the wall of the abdomen, behind and above the internal ring, where, amongst other adhesions, it was bound down by a strong band: a knuckle was also involved in the internal ring. The adhesions were so strong that I was tempted to give up the task of breaking them down, and only succeeded in doing so with the assistance of Dr. Reid, who was helping me with the operation. When we had got the bowel free, the portion which had been compressed by the band was found to be deeply ulcerated transversely, so that knuckle of bowel was brought up to the incision in the abdominal wall, and I determined to drain the bowel after the method of Dr. Greig Smith, detailed in the *British Medical Journal* some six months ago.

The parietal layer of peritoneum was stitched to the skin, and a small opening made into the bowel just large enough to hold tightly a drainage tube, the other end of which discharged into a bottle containing a solution of perchloride. A safety pin was passed through the muscular coats of the bowel and wall of the drainage tube, but without entering the calibre of the latter. Had a morphia suppository at 10 p.m., and another at 3 a.m.

September 26.—Has vomited a small quantity of coffee-coloured fluid during the night, and has had nutrient enemata. During the day the patient was quiet and comfortable, and there was no vomiting; flatus passed through the drainage tube freely; no more opium was given. At 10 a.m. pulse, 120; temperature, 96·4.

September 27.—Has had a good night, sleeping off and on all night; no pain; has passed flatus from rectum as well as through tube. During the day flatus was passed continuously per rectum, and a scanty liquid motion during the afternoon, about 48 hours after the operation. Pulse, 112; temperature, 99·4.

September 28.—Has had another good night. The wound looks irritable, especially at the upper part, where the ulcerated bowel forms the base of the wound. All stitches were removed. There is some escape of fæcal matter by the edges of the tube. Passed another scanty motion during the day. Has commenced taking barley water by the mouth. Pulse, 108; temperature, 99·4.

September 30.—The distention of the abdomen has been steadily subsiding, and is now normal. I stitched up the wound in the bowel with a good deal of difficulty, using a fine straight sewing needle; but I found this very ill-adapted to the purpose, not being able to pick up as much of the wall of the bowel as I wished, and where I only secured the peritoneal coat this tore very readily. I had some of these needles bent into a semi-circle, and when a couple of the sutures gave way two days afterwards the curved needles answered admirably.

The patient progressed favourably until the 3rd of October, taking food well and regularly, when pneumonia of the left lung set in, with rapid breathing and a good deal of pain in the left side. This gradually increased, and he died on the 5th.

I made a *post mortem*, and in the abdomen I found that some slight adhesions had reformed in the neighbourhood of the internal ring, but no bowel had entered this. The bowel attached to the abdominal wound was firmly adherent, and there were no signs either of peritonitis or of septicæmia. The pneumonia of the left lung was very extensive.

The case was interesting to me, as at the time of the operation we had to use so much force in breaking down the adhesions and matting together of the intestine that I had looked on the case as hopeless.

STATISTICS OF ABDOMINAL OPERATIONS AT ADELAIDE HOSPITAL.

During eleven years, from January 1, 1885 to December 31, 1895.

By C. E. TODD,
Assistant Surgeon to Adelaide Hospital.

For permission to publish these statistics I am indebted to the surgeons and assistant surgeons at the Adelaide Hospital, under whose care they came.

The list includes all those cases, as far as I can gather them, in which the peritoneum has been opened during eleven years.

There are in all 440 cases, with a total number of 99 deaths, a mortality of a little over 20 per cent.

Most of the earlier operations were done under the carbolic spray, and it is interesting to notice that the now obsolete method of operating upon abdominal hydatids by the large trochar was in use as late as 1886.

All the abdominal hydatid operations in the second series were by free incision and drainage, with the exception of a few cases in which Bond's method was adopted.

I had hoped to be able to arrive at the actual risk to life of opening the peritoneal cavity, but this I have been unable to do. One would have thought that deaths recorded as due to shock, hæmorrhage, or peritonitis, might be put down to the actual operation, but I find that many of the cases were in such a condition before operation that death cannot justly be attributed to the abdominal section, although it was in some cases accelerated by the surgical procedure.

No.	NAME.	SEX.	AGE.	OPERATION.	ANÆSTHET.	RESULT.	REMARKS.
					1885.		
1	E. N.	F	26	Hyd. of pelvis	Ether	Successful	
2	M. A. H.	F	46	Ovariotomy	Ether	Successful	
3	Mrs. S.	F	40	Ovariotomy	Ether	Successful	
4	M. D. L.	F	31	Amp. of uterus	Ether	Died	Supra vaginal amputation for fibroid of uterus
5	E. W.	F	39	Ovariotomy	Ether	Unsuccessful	Died of hæmorrhage
					1886.		
6	S. P.	F	27	Abdom. hyd.	Ether	Successful	Abdomen section
7	R. W.	M	35	Hyd. of liver	None	Successful	Large trochar
8	J. McC.	F	24	Abdom. sec.	Ether	Died	Peritoneal hyd. Died of peritonitis
9	S. McH.	F	30	Hyd. of liver	Ether	Successful	Large trochar
10	C. McM.	M	29	Hyd. of liver	None	Died	Large trochar
11	J. McN.	M	25	Hyd. of abd.	None	Successful	Cured (large trochar)
12	M. D.	F	35	Abdom. tum.	Ether	Recovered	The tumour was ruptured during examination under ether

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
13	A. J.	F	17	Hyd. of liver	Ether	Successful	Puncture, with large trochar
14	J. A.	F	25	Radical for hyd. of liver	Ether	Unsuccessful	Died of pneumonia
15	E. F.	F	25	Radical for hyd.	Ether	Cured	Hyd. of liver. Large trochar
16	D. S.	M	35	Radical for hyd.	None	Died	Abdom. hyd. Large trochar
17	M. J. J.	F	20	Op. for radical cure of hyd. of liver	Ether	Cured	Large trochar introduced. This case was aspirated a few days before on the supposition that it was one of ascites
18	A. B.	F	22	Abdom. sec.	Ether	Successful	Radical cure of hyd. of liver
19	W. S.	M	46	Abdom. sec.	Ether	Successful	Radical cure of hyd. of omentum
20	C. S.	F	20	Radical cure of hyd.	Ether	Partly successful	Hyd. of liver
21	J. McG.	M	25	Gastrotomy	Ether	Unsuccessful Recov. from operation	Search for foreign body in stomach. Patient recovered
22	A. W.	F	23	Ovariotomy	Ether	Died	
23	E. N.	F	24	Perityphlitis	Ether	Successful	
					1887.		
24	W. N.	M	54	Abdom. sec.	Ether	Cured	Hyd. of liver
25	H. A. S.	M	47	Abdom. sec.	Ether	Successful	Hyd. of liver
26	G. F.	M	57	Abdom. sec.	Ether	Died	Hepatic abscess
27	E. F.	F	40	Ovariotomy	Ether	Successful	Suppurating cyst; numerous adhesions
28	A. C.	F	27	Ovariotomy	Ether	Died	Double ovarian cysts. Exhaustion and epilepsy
29	M. A. K.	F	30	Ovariotomy	Ether	Died	On fourteenth day, of peritonitis; present at time of operation
30	A. H.	F	27	Hyd. of liver	Ether	Died	Large trochar
31	W. S.	M	28	Hyd. of liver	Ether	Successful	Large trochar and incision
32	M. F.	F	25	Hyd. of liver	Ether	Successful	Abdom. sec. A second cyst burst into the one first opened
33	E. S.	F	14	Abdom. sec.	Ether	Successful	Hyd. of liver. Carbolic spray used
34	A. H.	F	27	Abdom. hyd.	Ether	Died	Trochar
35	W. G.	M	35	Abdom. sec.	Ether	Relieved	For tumour
36	R. F.	M	27	Abdom. sec.	Ether	Unsuccessful	Hepatic hyd.
37	R. O.	F	3	Abdom. sec.	Ether	Unrelieved; recov. op.	Exploration of abdominal tumour
38	Mrs. P.	F	77	Laparotomy	Ether	Successful	
39	A. S.	M	25	Abdom. sec.	Ether	Successful	Hyd. of liver
40	M. N.	F	25	Abdom. absc.	Ether	Recovered	First operation. Peritoneum drained
41	F. T.	M	24	Abdom. sec.	Ether	Successful	Hyd. of liver
42	N. J. McG.	M	24	Absc. of liver	Ether	Died	Trocar and cannula
43	N. G. G.	F	36	Hysterectomy	Ether	Successful	For fibroid
44	W. J. McG	M	24	Absc. of liver	Ether	Died	Exhaustion
45	F. P.	M	52	Laparotomy	Ether		
46	E. L.	M	41	Abdom. sec.	Ether	Died	

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
47	E. A. S.	F	—	Abdom. sec.	Ether	Successful	Hyd. of liver
48	M. H.	F	12	Abdom. sec.	Ether	Successful	Hyd. of kidney. Contained daughter cysts
49	W. L.	M	15	Abdom. sec.	Ether	Successful	Hyd. of liver
					1888.		
50	M. H.	F	59	Ovariotomy	Ether	Successful	Multiloc. cyst.
51	C. P.	F	22	Abdom. sec.	Ether	Successful	Hyd. of liver
52	A. R.	F	18	For hyd.	Ether	Recovered	Multiple
52A	W. L.	M	15	Abdom. sec.	Ether	Successful	Hydatids (?) liver
53	M. N.	F	26	Laparotomy	Ether	Recov. Died 4 mos. after of diarr. & exhaustion	Collections of fœtid pus in both broad ligaments drained thr'gh vagina glass drain in abdomen
54	R. E	M	60	Laparotomy	Ether	Died	Peritonitis
55	M. McA.	F	50	Aspiration	Ether	Successful	Hyd. of Liver
56	M. W.	F	48	Ovariotomy	Ether	Death	Ovariot. double and hysterectomy
57	M. H.	F	16	Hyd. abd. sec.	Ether	Recovered	Hyd. of Omentum (probably liver)
58	M. B.	F	28	Oophorect.	Ether	Successful	Left enlarged ovary
59	S. D.	F	29	Abdom. sec.	Ether	Successful	Hyd. of liver
60	M. F.	F	26	Oophorect.	Ether	Successful	Both ovaries removed. Glass drainage tube removed on 2nd day
61	C. C.	F	30	Abdom. sec.	Ether	Died	Omental hyd.
62	M. S.	F	43	Ovariotomy	Ether	Died	Death four days after operation of peritonitis & broncho-pneumonia. Sero purulent fluid found *post mortem* in peritoneum
63	M. H.	F	17	Opening up	Ether	Successful	Abdominal section
64	J. W.	F	43	Oophorect.	Ether	Successful	
65	T. T.	M	18	For hyd.	Ether	Successful	Of liver
66	G. C.	M	30		Chloro. & ether	Died	Rupture of gut
67	P. W.	M	58	Gastrostomy	Ether	Successful	
68	E. H.	F	34	Oophorect	Ether	Successful	
69	J. G.	M	16	Abdom. sec.	Ether	Recovery	Exploratory incision into tumour
70	C. D.	M	53	Abdom. sec.	Ether	Recovery	Rad. cure of abdom. hyd.
71	W. S.	M	45	Laparotomy	Ether	Recovery	Exploratory op'ration
72	C. P.	M	11	Exploratory Lap.	Ether	Recovery	
73	A. P.	F	60	Removal calcified Hyd.	Ether	Recovery	From liver
74	M. O. B.	F	19	Thoracic Abdom. sec.	Ether	Failed to find cyst.	For hyd. in upper surface of liver
75	L. M.	F	55	Abdom. sec.	Ether	Died	Peritonitis
76	M. O'B.	F	19	Removal of hyd. cyst,	Ether	Recovery	Also removal of rib and opening pleural cavity for empyæma
77	M. F.	M	25	Abdom. sec.	Ether	Recovery	
78	M. S.	F	48	Hyd. of liver	Ether	Recovery	Suppurating
79	W. P.	M	38	Duodenostomy	Ether	Died	Cancer of stomach
80	M. P.	F	41	Ovariotomy	Ether	Recovery	

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
81	S. S.	F	7	Abdom. sec.	Ether	Recovery	Hyd. of liver
82	E. S.	F	34	Laparotomy	Ether	Recovery	Abdom. hyd.
83	E. W.	F	20	Oophorect.	Ether	Recovery	
84	W. O'C	M	25	Laparotomy	Ether	Relieved	Hepatic hyd.
85	J. H.	F	48	Hysterect.	Ether	Recovery	
					1889.		
86	M. W.	F	17	Hep. abscess	Ether	Recovery	Laparot. done
87	J. B.	M	26	Explor. incis.	Ether	Recovery	Tumour found sarcomatous and attached to ilium; could not be removed
88	I. W.	F	23	Oophorect.	Ether	Recovery	
89	A. R.	F	7	Laparotomy	Ether	Recovery	For abdom. hyd.
90	A. S.	F	22	Oophorect.	Ether	Recovery	
91	S. M.	F	31	Oophorect.	Ether	Recovery	Hyds. discovered in psoas muscle
92	M. L.	F	10	Remov. Hyd.	Ether	Successful	Sit. in right lobe
93	K. B.	F	24	Oophorect.	Ether	Successful	Both ovaries removed
94	K. P.	F	24	Hyd. of liver	Ether	Successful	Laparot. performed
95	E. D.	F	28	Oophorect.	Ether	Successful	
96	E. B.	F	17	Laparotomy	Ether	Successful	Removal cyst
97	M. S.	F	38	Incision	Ether	Died	For hyd. of liver
98	B. J.	F	14	Excision	Ether	Successful	To remove hyd. of liver
99	A. O. K.	M	45	Exploration	Ether	Successful	Of hepatic tumour; found pus
100	A. O. K.	M	45	Abdom. sec.	Ether	Died	Ecto cyst was calcified and had to be removed
101	M. T.	F	27	Laparotomy	Ether	Successful	Removal of left ovary
102	S. D.	F	32	Prolapsed ovaries	Ether	Recovery	Oophorect. performed
103	F. H.	F	18	Abdom. sec.	Ether	Recovered	For hyd. of liver
104	M. H.	F	50	For uterine fibroid	Ether	Recovery	Laparot. and removal, with amp. of uterus
105	W. O'C.	M	25	Incision into liver	Ether	Recovery	To open up old hyd. cavity
106	L. S.	F	24	Abdom. sec.	Ether	Died	For suppurating hyd.
107	G. A.	M	39	Abdom. sec.	Ether	Died; recv. from op.	Supposed hyd. of liver found to be malign't.
108	E. P.	F	27	Removal of uterine appendages	Ether	Recovery	
109	A. G.	F	25	Hyd. of liver	Ether	Recovery	Radical operation
110	A. K.	F	18	Remov. of hyd	Ether	Recovered	
111	J. S.	M	45	Laparotomy	Ether	Died	For abscess of liver
112	R. McM.	M	50	Laparotomy	Ether	Recovery	For hyd. of liver
113	C. G.	M	57	Gastrot.	Ether	Died	Malignant disease of œsophagus
					1890.		
114	J. H.	M	22	Hyd.	Ether	Recovery	In iliac fossa
115	P. A.	M	22	Incis. hepatic abscess	Ether	Recovery	
116	E. K.	F	—	Hysterect.	Ether	Recovery	
117	M. D.	F	16	Abdom. sec.	Ether	Recovery	Supp. hyd. of liver

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
118	A. T.	F	18	Ovariotomy	Ether	Recovery	Large cystic T. of left ovary ; right ovary cystic also removed
119	D. T.	M	59	Hyd. of liver	Ether	Recovery	
120	M. O'S.	F	—	Abdom. sec.	Ether	Recovery	Hyd. of liver
121	A. H.	F	—	Laparotomy	Ether	Recovery	Ascites—ovarian
122	J. G.	F	32	Laparotomy	Ether	Recovery	Drain'g pelvic abscess
123	M. O'S.	F	35	Abdom. sec.	Ether	Recovery	Draining peritonæl abscess caused by escape daughter cysts from rupture of original cyst
124	E. M.	F	—	Abdom. sec.	Ether	Recovery	
125	M. B.	F	33	Abdom. sec.	Ether	Death from shock, 20hr.	
126	E. M.	F	—	Ing. colotomy	Ether	Death	Death on table, asthenia and shock
127	T. J.	M	65	Abdom. sec.	Ether	Recovery	Hyd. of liver
128	T. F.	M	54	Abdom. sec.	Ether	Death	Malignant disease of hd. of pancreas found. Nothing further done
129	H. K.	M	32	Abdom. sec.	Ether	Died	Abscess of liver
130	L. E.	F	5	Abdom. sec.	Ether	Recovery	Hyd. of liver—right lobe
131	W. R.	M	50	Abdom. sec.	Ether	Recovery	Hyd. of liver—L.C.
132	M. A. F.	F	—	Intest prolapse	Ether	Died, perit.	
133	J. C.	F	26	Abdom. sec.	Ether	Recovery	Abdom. tumour—not reached
134	C. W.	F	—	Ovariotomy	Ether	Recovery	Parovarian cyst ; left ovary removed
135	J. W.	M	65	Abdom. sec.	Cocaine	Died	Hyd. abcess of liver
136	K. McG.	F	53	Cholecystot.	Ether	Died, exhaustion	No stone found ; two passed next day. Malig. dis. pancreas
137	R. W.	F	18	Abdom. sec.	Ether	Recovery	Ovarian abscess drained & stitched to abdominal walls
138	M. O'C.	F	—	Oophorect.	Ether	Recovery	Both ovaries removed, cystic
139	J. T.	F	38	Laparotomy	Ether	Recovery	Removal both ovaries and appendages
140	E. C.	F	34	Abdom. sec. rup. ectopic gestation	Ether	Died	Shock
					1891.		
141	W. W.	M	54	Abdom. sec.	Ether	Recovery	Hyd. of liver—right lobe
142	R. V.	F	55	Kolpo-hyster.	Ether	Death	Supp. peritonitis
143	E. P.	F	32	Salpingo-oophorect.	Ether	Death, 36hrs. supp. perit.	Extensive pelvic cellulitis, & abscesses as well
144	M. L.	F	35	Abdom. sec.	Ether	Death, 24hrs. peritonitis	Suturing coats of stomach (21 gun-shot wounds)
145	R. V.	F	55	Abdom. sec.	Ether	Death	Supp. peritonitis, to drain and wash out abdom. cavity
146	A. B.	F	30	Salpingo-oophorect.	Ether	Recovery	Both ovaries

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
147	E. K.	F	44	Kolpo-hyster.	Ether	Recovery	
148	M. T.	F	—	Kolpo-hyster.	Ether	Death	24 hours. Shock
149	E. S.	F	60	Kolpo-hyster.	Ether	Death, supp. peritonitis	Carcin.
150	M. T.	F	20	Ovariotomy	Ether	Recovery	L. ov. multiloc. cyst from dermoid., cyst 6lbs., fluid 28lbs.
151	S. C.	M	60	Hyd. of liver	Ether	Recovery	Abdom. sec., 2 cysts found
152	A. O'B.	M	53	Abdom. sec.	Ether	Recovery	Explor. hyd., malig. dis. of pancreas and omentum
153	J. W.	F	17	Abdom. sec.	Ether	Recovery	Hyd. of omentum
154	C. P.	F	40	Oophorect.	Ether	Recovery	
155	F. G.	F	38	Abdom. sec.	Ether	Died	R'pt'red hyd. of liver
156	M. B.	F	52	Ovariotomy	Ether	Recovery	5½lbs. fluid 14½ pts.
157	E. A.	F	20	Abdom. sec.	Ether	Unrelieved	Soft sarcoma in pelvis. Abandoned.
158	M. T.	F	50	Abdom. sec.	Ether	Unrelieved	Malignant disease, right ovary; Abdom. closed again
159	E. D.	F	39	Abdom. sec.	Ether	Death	Hyd. of liver
160	S. C.	F	60	Abdom. sec.	Ether	Recovery	Hyd. of liver, right lobe
161	H. H.	F	50	Cholecystot.	Ether	Recovered from operation, died carcinom of pancreas involving duct.	Stones impacted, not removed
162	A. M.	F	41	Abdom. sec.	Ether	Recovery	Gall stones (none found)
163	E. A.	F	29	Abdom. sec.	Ether	Died in 1½hrs	Shock
164	L. F.	F	29	Oophorect.	Ether	Recovery	Both ovaries remov'd
165	B. W.	M	67	Abdom. sec.	Ether	Recovery	Hyd. of liver, right lobe
166	A. B.	F	32	Abdom. sec. Salpingo-oophor.	Ether	Recovery	Cystic ovaries hyd. salpinx. fluid in right lobe, left slightly distended
167	S. C.	M	60	Abdom. sec.	Ether	Recovery	Malignant growth in hyd. sac.
168	R. R.	F	9	Abdom. sec.	Ether	Recovery	Hyd. of kidney
169	R. R.	F	9	Asp.	Ether	Recovery	Asp. of hyd. of liver
170	J. C.	M	24	Abdom. sec.	Ether	Recovery	Hyd. of liver, left lobe suppurating
171	R. B.	F	29	Salpingo-oophor.	Ether	Recovery	Chr. ovaritis
172	F. W. C.	M	30	Abdom. sec.	Ether	Death in 3hrs	Internal obstruction (not found)
173	B. N.	F	25	Abdom. sec.	Ether	Recovery	Oophorectomy
174	R. R.	F	9	Abdom. sec.	Ether	Recovery	Hyd. of liver
175	E. C.	F	17	Abdom. sec.	Ether	Recovered from operat.; died from exhaustion 3 months after op'r't'n.	Pelvic abscess; foul pus abdom. flushed out; glass drain used; p. m. showed abscess, began right tube; caused general peritonitis
176	E. W.	F	29	Abdom. sec.	Ether	Death thirty-six hours. P. M. ectopic gestation in B. L.	
177	A. S.	F	—	Ovariotomy	Ether	Recovery	Cyst of B. L.; left ovary

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
178	K. A.	F	33	Oophorect.	Ether	Recovery	Both ovaries prolapsed and matted down in Douglas pouch
179	A. R.	F	25	Cholecystot.	Ether	Recovery	Four gall stones removed
180	M. D.	F	22	Abdom. sec.	Ether		For hyd. of liver
181	L. D.	F	30	Ovariot. and Hysterect. (Mal. disease)			Drainage tube used. Wire of the serre-nœud slipped from pedicle. Death from peritonitis
182	J. K.	M	—	Abdom. sec.	Ether	Died	Enlarged spleen
183	E. U.	F	39	Abdom. sec. Remov. ovary up. right side	Ether	Recovery	
184	W. S.	M	13	Abdom. sec.	Ether	Recovery	For hyd. of liver
185	E. G.	F	27	Oophorect.	Ether	Recovery	Double
186	E. H.	F	39	Ingscolotomy	Ether	Died supp. peritonitis	Rectal stricture
187	M. W.	F	33	Abdom. sec.	Ether	Death	
188	E. B.	F	39	Kolpo. Hystr.	Ether	Died shock and periton.	
189	H. McL.	F	—	Abdom. sec.	Ether	Recovery	Tubo. ovarian abscess stitched to abdom. wall
190	J. W.	M	14	Hyd. of liver	Ether	Recovery	
191	H. McL.	F	—	Abdom. sec.	Ether	Recovery	Tubo. ovarian abscess drained
192	M. M.	F	52	Ovariotomy	Ether	Recovery	Single cyst right ovary
193	F. G.	M	68	Abdom. sec.	Ether	Death shock	Hyd. of liver–spleen
					1892.		
194	E. N.	F	22	Abdom. sec.	Ether	Recovery	Hyd. of liver
195	W. W.	F	27	Ovariotomy	Ether	Death, shock	Cyst, L. ovary; many adhesions
196	E. R.	F	31	Oophorect.	Ether	Recovery	Double, prolapsed ovaries
197	L. M.	M	65	Abdom. sec.	Ether	Death	Hyd. of kidney R.
198	A. J.	M	27	Abdom. sec.	Ether	Recovery	Hyd. of liver
199	M. H.	F	38	Kolpo-hyster.	Ether	Recovery	Prolapse (ovaries not removed
200	E. B.	F	47	Kolpo-hyster.	Ether	Recovery	Prolapse
201	W. K.	M	57	Laparotomy	Ether	Died	Exploratory. Carcinom of pylorus found
202	J. W.	M	48	Hyd. of L. lobe, liver	Ether	Death supp. peritonitis	Abdom. sec. No mother cyst; abt. 6 daughter cysts; 3 pts. fluid. P.M. mother and daughter cysts found in situ
203	M. H.	F	27	Abdom. sec.	Ether	Recovery	Pelvic abscess; not accessible
204	A. S.	F	—	Oopherect.	Ether	Recovery	Double cystic
205	E. M.	F	—	Oopherect.	Ether	Recovery	
206	L. F.	F	29	Laparotomy	Ether	Recovery	
207	J. M.	F	48	Hysterect.	Ether	Died perit.	
208	E. Q.	F	23	Oopherect.	Ether	Recovery	C. tubes, double
209	E. B.	F	47	Kolporraphy	Ether	Recovery	Ant. semi-lunar flap from ant. wall

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
210	E. S.	M	18	Hyd. of liver	Ether	Recovery	One L. lobe, single cyst, one R. and many daughters and mother cysts
211	E. B.	F	26	Oopherect.	Ether	Recovery	R. ovary excisd.
212	T. F.	F	5	Abdom. sec.	Ether	Recovery	Sarcoma of mes. gl'nds No drainage tube inserted. Exploratory
213	E. W.	F	26	Amp. through thigh	Ether	Recovery	Hyd. of tibia
214	M. B.	F	62	Ovariotomy	Ether	Recovery	Ovarian cyst
215	C. B.	M	58	Abdom. sec.	Ether	Death, perit.	Carcinoma of liver. Abandoned
216	E. B.	F	49	Hysterect.	Ether	Died	
217	E. J.	F	30	Explor. gall bladder	Ether	Recovery	Sinus existing after cholecystot.; no stone found
218	H. McL.	F	25	Oophorect.	Ether	Died perit.	Right ovary removed
219	H. H.	F	45	Cholecystot.	Ether	Recovery	Small gall stones, 15oz., fluid removd.
220	H. McL.	F	29	Abdom. sec.		Death, 10hrs. peritonitis	Abdom. re-opened—peritonitis—washed out
221	E. H.	F	37	Hyd. of liver	Ether	Recovery	Operation suspended on act. hæmorrhage
					1893.		
222	H. T.	M	45	Hyd. of liver	Ether	Died peritonitis empyema, two oth'r l'rge cysts in right lobe found at p.m., each holding abt. 2 pints	2 mother cysts supp., and many daughter cysts, contents abt. 2 pints
223	S. O.	F	28	Abdom. sec.	Ether	Died	Pelvic peritonitis
224	R. W.	F	58	Oophorect.	Ether	Recovery	
225	C. M.	F	31	Salpingo-oophorect.	Ether	Recovery	Double
226	L. P.	F	24	Oophorect.	Ether	Recovery	Double, cystic ovaries
227	M. F.	F	35	Abdom. sec.	Ether	Recovery	Hyd. of broad ligature many daughter cysts
228	J. McN.	M	41	Abdom. sec.	Ether	Recovery	2 hyd. of omentum, each containing a few daughter cysts
229	M. J.	F	34	Oophorect.	Ether	Recovery	Double
230	E. M.	F	28	Hyd. of liver	Ether	Recovery	Abdom. sec., right lobe, mother and daughter cysts
231	H. P.	M	36	Abdom. sec.	Ether	Recovery	Hyd. of right lobe liver: single large cyst, suppurating
232	J. J.	M	35	Abdom. sec.	Ether	Recovery	One pelvic cyst; many daughter cysts found; contents about 2 pints; 1 abdom. cyst (omental); mother & many daughter cysts, containing about 1½ pints
233	A. B.	E	20	Nephrorraphy	Ether	Recovery	Right kidney, abdom. sec., explor. first

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
234	B. J.	F	56	Abdom. sec.	Ether	Died. *Post mortem*. 2nd Hyd. supp. dome of liver. Burst into right pleura	Hyd. right lobe liver. Mother and many daughter cysts. Contents abt. 2 pints
235	W. H. R.	M	30		Ether	Recovery	Sarcoma left kidney. Op. abandoned
236	L. S.	F	—	Abdom. sec.	Ether	Recovery	
237	M. M.	F	23	Abdom. sec.	Ether	Recovery	Exploratory. Enlargement of liver found
238	M. S.	F	60	Ant. Kolporraphy	Ether	Recovery	
239	J. J.	M	35	Abdom. sec.	Ether	Recovery	Explor. for hydatids. Nothing found.
240	J. B.	F	28	Perineorraphy	Ether	—	Tait's op.
241	J. B.	F	28	Oophorect.	Ether	Death. *Post mortem*. Lig. slipped from hæmorr. shock. Periton.	Both ovaries cirrhosed and cystic
242	F. T.	F	20	Abom. sec.	Ether	Recovery	Ovar. abscess drained. Tube not removed
243	E. M.	F	59	Abdom. sec.	Ether	Recovery	Hyd. of liver. Large mother cyst. No daughter cysts. Suppurating. Abt. 20 oz.
244	L. L.	F	19	Abdom. sec.	Ether	Death 10 hrs.	Septicæmia. P. washed out
245	H. M.	F	73	Abdom. sec.	A.C.E.	Recovery	Ovarian tumours between layers of meso-colon. Op. abandoned.
246	E. M.	F	28	Abdom. sec.	A.C.E.	Death. No *post mortem* allowed. Supp.	Hyd. of omentum. Four cysts excised
247	E. M.	F	28	Thoracico abdominal sec.	A.C.E.	Hyd. liver bursting in pleural cav.	Hyd. left lobe liver. One large, several double cysts
248	E. R.	F	31	Oophorect.	Ether	Recovery	Prolapsed and cystic ovaries, double
249	A. A.	F	19	Oophorect.	Ether	Recovery	Cystic and prolapsed ovaries, double
250	E. P.	M	53	Abdom. sec.	Ether	Recovery	Perforation in feb. gut
251	F. W.	F	24	Oophorect.	Ether	Recovery	Double cystic ovs.
252	D. C.	M	30	Hyd. of liver	Ether	Recovery	Abdom. sec. Right lobe tapped ten years ago
253	J. I.	M	12	Abdom. sec. (Explor.)	Ether	Death	Perit. Multiple pyemic abscess of liver; abdomen closed
254	M. O'C.	F	—	In. pelvic abscess	Ether	Recovery	Pyo-salpingitis (L.) opened above groin
255	B, W.	M	66	Abdom. sec.	Ether	Recovery	Hyd. of liver, left lobe. No mother cysts; daughter cysts. Supp. Cont. 5 pnts.
256	A. B.	F	31	Abdom. sec.	Ether	Recovery	Hyd. of omentum. No mother cyst; many da'ghtr. cysts. Supp. Cont. 4 pnts.
257	M. W.	F	—	Abd. Hyster.	Ether	Recovery	Uterine fibroid
258	A. G.	F	—	Abdom. sec.	Ether	Recovery	Double pyo-salpinx and ovarian abscess. Ovaries & tubes removed
259	A. McL.	F	—	Abdom. sec.	Ether	Recovery	Double pyo-salpinx. Ovaries removed

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
260	J. R.	F	29	Abdom. sec.	Ether	Recovery	Pyo-salpinx. Both ovaries removed
261	T. B.	M	12	Abdom. sec.	Ether	Recovery	Hyd. right lobe, liver. One mother and several daughter cysts, containing about 1 pint
262	J. C.	F	60	Abdom. sec.	Ether	Death	Hyd. cyst opened
263	C. C.	M	13	Abdom. sec.	Ether	Death	Abscess appendicitis
264	P. H.	M	36	Cholecyst'my	—	Death, perit. & hæmorrh'g.	Only grit found
265	C. H.	F	20	Oophorect.	Ether	Recovery	Cystic and prolapsed ovaries
266	A. J.	M	13	Abdom. sec.	Ether	Recovery	Explor. for Hyd. Nothing found
267	J. C.	M	76	Abdom. sec.	Ether	Recovery	Abscess of gall bladder Large stones remov'd
268	A. S.	F	29	Ovariotomy	Ether	Death	Semi-solid tumour of left ovary; right cys. removed also
269	B. J.	F	—	Oophorect.	Ether	Recovery	Double, for uterine fibromata
270	W. G.	M	18	Hyd. of liver	Ether	Recovery	Right lobe; abd. sec. One large mother; no daughter cysts
271	M. C.	F	—	Oophorect., double & Hys.	Ether	Recovery	
					1894.		
272	E. T.	F	43	Hysteropexy			
273	C. G.	M	29	Abdom. sec.	Ether	Recovery	Peri-nephritic abscess. R. pleura also opened
274	E. S.	M	19	Abdom. sec.	Ether & A.C.E.	Recovery	Expl'ratn after operat'n for hyd.; freeing omentum adherent to liver
275	R. B.	M	27	Abdom. sec.	Ether	Recovery	Hyd. of right lobe. Mother cyst; no daughter cysts; containing 6 oz.
276	G. J.	F	21	Abdom. sec.	Ether	Recovery	Hyd. right lobe. Many daughter cysts; containing 1½ pints, and mother cyst
277	E. B.	F	31	Abdom. sec.	Ether	Recovery	Explor.; nothing f'nd.
278	C. R.	F	24	Oophorect.	Ether	Recovery	Double
279	M. T.	F	23	Abdom. sec.	Ether	Died 8 hrs.	Acute intestinal obstruction. Gut gangrenous moribund
280	E. C.	F	26	Salpingo-oophorect.	Ether	Recovery	Double
281	E. O'D.	F	20	Abdom. hysterect.	Ether	Recovery	Ovaries removed; intra mural fibroid
282	M. W.	F	45	Oophorect.	Ether	Death, shock	Uterine fibroids
283	E. C.	F	38	Abdom. sec.	Ether	Recovery	Ectopic gestation, left tube
284	L. W.	F	26	Abdom. sec.	Ether	Death, shock 12 hours	Ectopic gestation, left tube
285	C. G.	M	37	Abdom. sec.	Ether	Recovery	Preliminary incision middle line. Hyd. right lobe liver sec. 10th rib. supp. Mother and many daughter cysts

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
286	M. J. W.	F	27	Abdom. sec. oophor. dbl.	Ether	Recovery	Fibroma
287	A. W.	F	35	Abdom. sec.	Ether	Recovery	Pyo-salpingitis (L.) dbl. salpingo-oophor.
288	M. J. S.	F	27	Salpingo-oophorect.	Ether	Recovery	Double pyo-salpingit.
289	L. K.	M	14	Hyd. of liver	Ether	Recovery	Abdom. sec., single large and minute daughter cysts
290	K. O'C.	F	21	Oophorect.	Ether	Recovery	Double cysts and prolapsed ovaries
291	M. B.	F	27	Ovariotomy	Ether	Recovery	Simple cyst, no ad.
292	E. L.	F	29	Oophorect.	Ether	Recovery	Left ovary only (cystic)
293	A. H.	F	43	Abdom. sec.	Ether	Recovery	Malignant disease—abandoned
294	E. S.	F	39	Oophorect.	Ether	Recovery	Double
295	F. B.	F	20	Ovariotomy	Ether	Recovery	T. of left ovary. Right cystic removed
296	A. P.	F	—	Abdom. sec.	Ether	Recovery	Pyo-salpinx (L.) dbl. salpingo-oophorect.
297	J. M.	F	20	Oophorect.	Ether	Recovery	Double cystic ovary
298	N. A.	F	29	Hysterop.	Ether	Recovery	
299	N. A.	F	29	Perineorraphy	Ether	Recovery	
300	J. P.	F	37	Abdom. sec.	Ether	Recovery	Dermoid cyst right ovary. Cyst of left ovary
301	C.M.	F	32	Abdom. sec.	Ether	Recovery	Ectopic gestation L.R. ov. removed
302	A. H.	F	57	Hysterop.	Ether	Recovery	
303	M. McM.	F	56	Abdom. sec.	Ether	Recovery	Malignant growth of uterus. Op. abandoned without attempt at removal
304	E. S.	F	35	Abdom. sec.	Ether	Recovery	Freeing adhesions after oophorect.
305	M. B.	F	41	Abdom. sec.	Ether	Recovery	Hyd. of liver R. lobe mother and many d. cysts many of latter. Tapped (Dr. Thomas) Jan. 14, '81, Mar. 24, June 1, '81, June 14, '82. Dr. Hayward, Feb. 8, 94. On first occasion fluid thick like pus.
306	E. B.	F	30	Abdom. sec.	Ether	Death 8 hrs.	Explor. patient moribund. Intest. obstruction from pelvic peritonitis
307	S. C.	F	43	Ovariotomy	Ether	Recovery	R. par ovarian cyst. L ov. not removed, matted down
308	M. R.	F	28	Oophorect.	Ether	Recovery	Double cystic ov.
309	G. B.	F	26	Cystotomy	Ether	Recovery	Growth—none found
310	J. B.	M	57	Abdom. sec.	Ether	Recovery	Sarcoma omental? abandoned
311	H. W.	M	40	Abdom. sec.	Ether	Recovery	Hyd. of liver. Mother and many hundreds daughter cysts. Ant. wall calcified.
312	J. McK.	F	18	Oophorect.	Ether	Recovery	Double cystic ovaries
313	M. W.	F	18	Abdom. sec.	Ether	Recovery	Malignant of omentum. Abandoned
314	J. M.	F	20	Abdom. sec.	Ether	Recovery	To free adhesions of uterus after ooph'r'ct

No.	Name.	Sex.	Age	Operation.	Anæsthet.	Result.	Remarks.
315	M. K.	F	38	Abdom. sec.	Ether	Recovery	Hyd. of liver L. lobe. 1 mother cyst, 1 pint fluid
316	S. G.	F	22	Abdom. sec.	Ether	Recovery	For tubal pregnancy
317	G. B.	F	27	Abdom. sec.	Ether	Recovery	Proliferating cyst of Broad Lig.
318	B. T.	F	24	Oophorect.	Ether	Recovery	Cystic ovary
319	J. W.	F	21	Abdom. sec.	Ether	Recovery	Hyd. of liver, R. lobe mother and many d. cysts. No fluid
320	J. B.	F	46	Abdom. sec. explor.	Ether	Death	Mal. of liver? Cholecystotomy
321	B. T.	F	27	Ovariotomy	Ether	Recovery	Double par ovarian
322	J.D. (Abt)	M	60	Abdom. sec.	A.C.E.	Recovery	Hyd. of liver, right lobe. Mother cyst; no daughter cysts. Cont. abt. 6 pints.
323	F. S.	M	41	Abdom. sec.	Ether	Recovery	Hyd. of liver, right lobe. No mother cyst. Cont. about 6 pints.
324	E. D.	F	21	Oophorect.	Ether	Recovery	Double tuberculosis. Tubercular abscess of right ovary
325	M. K.	F	19	Ovariotomy	Ether	Recovery	Double; pedicle of left cyst twisted
326	E. B.	F	22	Oophorect.	Ether	Recovery	Double cystic ovaries
327	L. D.	F	20	Oophorect.	Ether	Recovery	Double pyo-salpingitis and abscess of right ovary
328	G. N.	F	20	Oophorect.	Ether	Recovery	Double pyo-salpingitis
329	E. W.	F	35	Salpingo-Oop.	Ether	Recovery	Double pyo-sal.
330	M. H.	F	—	Oophorect.	Ether	Recovery	Double cystic ovaries (prolapsed)
331	M. H.	F	—	Hysterop.	& chlor.		
332	L. D.	F	31	Oophorect.	Ether	Recovery	Double cystic ovaries
333	G. B.	F	27	Laparotomy	Ether	Death. 2 hrs. Shock	Removal of recurrent malignant growths proliferating in broad ligament
334	M. H.	F	37	Oophorect.	Ether	Recovery	Fibromata of uterus
335	A. C.	F	31	Hysterop.	Ether	Recovery	
336	J. H.	F	29	Laparotomy	Ether	Recovery	Peritonitis. Washing out
337	R. S.	F	—	Perineorraphy	—	Recovery	Tait's op.
338	R. S.	F	—	Hysterop.			Double cystic ovary
339	R. S.	F	—	Oophorect.			
340	A. W.	F	7	Abdom. sec.	A.C.E.	Recovery	For malignant tumour
341	A. L. P.	F	22	Oophorect.	Ether	Recovery	
342	H. S.	F	22	Oophorect.	Ether	Recovery	
343	H. S.	F	22	Perinorraphy Hysterop.	Ether	Recovery	
344	M. R.	F	38	Cholecystot.	Ether	Recovery	For gall stones
345	L. S.	F	—	Abdom. sec.	Ether	Recovery	Pyo.-salpinga. Drained
346	E. W.	F	50	Abdom. sec.	Ether	Recovery	Exploratory tubal peritonitis
					1895.		
347	C. D.	F	41	Laparotomy	Ether	Recovery	Exploratory sarcoma
348	R. K.	F	26	Laparotomy	Ether	Death, 6 hrs.	Exploratory; peritonitis, from tub. ovaries moribund

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
349	J. H.	F	23	Hyst'r'ct. abd.	Ether	Death, peritonitis	Inverted uterus, and double oophorect.
350	J. M.	M	30	Hyd. of liver	Ether	Recovery	Abdom. sec., right lobe, mother & many daughter cysts, supp., containing 2 pints
351	J. L.	F	29	Oophorect.	Ether	Recovery	Right ovary ; left removed previously
352	A. H.	F	31	Laparotomy	Ether	Recovery	Peri-hepatic abscess—left lobe
353	E. S.	F	20	Perineorraphy and hysterop.	Ether	Recovery	
354	E. H.	M	20	Laparotomy	Ether	Recovery	Supra-pubic cyst't'my ; bladder could not be opened ; closed
355	S. M. C.	F	47	Ovariotomy	Ether	Recovery	Large cyst left ovary ; rt. ovary not removed
356	E. S.	F	20	Hysterop.	Ether	Recovery	
357	M. B.	M	18	Laparotomy	Ether	Recovery	Exploration—hydatid, none found
358	I. P.	F	47	Ovariotomy	Ether	Recovery	Cyst—left ovary
359	E. D.	F	29	Oophorect. hysterop.	Ether	Recovery	Single (L.)
360	A. H.	M	65	Inguinal colotomy	Ether	Recovery	Cancer of rectum
361	E. G.	F	20	Hysterop.	Ether	Recovery	Removal par. ovarian cyst
362	—	F	—	Laparotomy	Ether	Recovery	Freeing ovarian and tubal adhesions
363	W. L.	M	35	Abdom. sec.	Ether	Recovery	Appendicitis
364	E. S.	F	22	Laparotomy	Ether	Recovery	Ectopic gestation ; other ovary removed also
365	I. H.	F	17	Abdom. sec.	Ether	Recovery	Cyst of gastro hepatic omentum
366	M. M.	F	26		Ether	Recovery	Hysterop., abandoned on account adhesions
367	M. B.	F	39	Abdom. sec.	Ether	Recovery	Hyd. of liver (R.) ; single cyst removed ; abdom. closed
368	S. R.	F	23	Hysterop.	Ether	Recovery	
369	M. M.	F	43	Oophorect.	Ether	Recovery	Double for uterine myomata
370	E. S.	F	44	Laparotomy	Ether	Recovery	Chr. peritonitis, but uterine or ovarian trouble discovered
371	M. H.	F	29	Hyd. of liver	Ether	Death, peritonitis	Abd. sec., mother cyst only, about 4oz ; right lobe, cyst removed ; treated Bond's method ; abd. closed
372	E. K.	F	33	Abdom. sec.	Ether	Recovery	Tumour in mesentery (malig.), abandoned
373	M. A. W.	F	27	Oophorect.	Ether	Recovery	Double
374	J. F.	F	34	Oophorect.	Ether	Recovery	Double, par. ovarian cyst and fibrous ovaries
375	F. H.	F	27	Salpingo-oophorect.	Ether	Recovery	Dble. dense adhesions & abscess both sides
376	E. H.	F	31	Oophorect.	Ether	Recovery	Double fibrous ovary, rt., ovarian tumour, left side

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
377	E. K.	F	20	Salpingo-oophorect.	Ether	Recovery	
378	L. L.	F	33	Ab. hysterect.	Ether	Recovery	Uterine myoma.
379	E. A.	F	44	Ovariotomy	Ether	Recovery	Right ovary, contain. 37 pints cyst, left cystic ov. also remvd.
380	M. W.	F	—	Salpingo-oophorect.	Ether	Recovery	
381	A. R.	F	31	Hyd. of liver	Ether	Recovery	Abd. sec., right lobe, single cyst, $\frac{3}{4}$pt., no daughter cyst
382	A. R.	F	31	Int. obstruct.	Ether		Bands divided
383	J. H.	M	24	Laparotomy	Ether	Death	Divided, re-opened, two other bands
384	E. W.	F	17	Abdom. sec.	Ether	Recovery	Pelvic abscess, drains probably into ovaries
385	A. R.	F	19	Abdom. sec.	Ether	Death, supp., peritonitis	Appendicitis, appndx. excised · A deep septic abscess opend.
386	M. L.	F	30	Hysterop.	Ether	Recovery	
387	S. M.	F	36	Ventral hernia	Ether	Recovery	After oophorectomy, radical cure
388	M. C.	F	12	Abdom. sec.	Ether	Recovery	Hyd. of liver, right lobe, mother cyst 1 pt. fluid, no daughter cysts
389	H. H.	F	41	Abdom. sec.	Ether	Large mother cyst and second cavity came away almost entirely	Hyd. of liver, left lobe, mother & many daughter cysts communicating with other cysts higher in liver
390	C. M.	F	48	Abdom. sec.	Ether	Death—periton.	Peritonitis ; gut to be gangrenous, evidently so 3 or 4 days
391	M. O.	F	32	Hyst'r'ct. abd.	Ether	Recovery	Fibroma
392	K. M.	F	24	Hysterop.	Ether	Recovery	
393	D. S.	F	52	Abdom. sec.	Ether	Recovery	Hyd., right lobe, sec. 7th rib ; pleura stitched ; mother & many daughter cysts containing 1 pint
394	H. T	F	35	Hysterop.	Ether	Recovery	
395	J. G.	M	45	Laparotomy	Ether	Recovery	Explor., sarcoma of spleen
396	S. S.	F	45	Laparotomy	Ether	Death shock	Excision matted and thickened omentum
397	F. G.	F	38	Hysterop.	Ether	Recovery	
398	E. G.	F	38	Laparotomy	Ether	Recovery	Explor. appendicitis
399	N. H.	F	22	Laparotomy	Ether	Recovery	
400	A. S.	F	23	Hysterop.	Ether	Recovery	
401	H. T.	F	62	Laparot.	Ether	Recovery	
402	E. A. T.	M	23	Abdom. sec.	Ether	Recovery	Hyd. of liver, right lobe, Bond's method ; mother, no daughter cysts, containing about 3 ounces
403	M. C.	F	13	Hyd. of liver	Ether	Recovery	
404	E. M.	F	27	Oophorect.	Ether	Recovery	Double cystic and prolapsed ovaries
405	A. B.	F	48	Laparotomy	Ether & chlor.	Recovery	Explor., sarcoma of uterus
406	E. S.	F	35	Laparotomy	Ether	Recovery	Explor. for adhesions. Nothing done
407	R. S.	F	26	Hysterop.	Ether	Recovery	

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
408	M. S. (ab.)	M	30	Abdom. sec.	Ether	Recovery	Explor. hyd. (?) None found
409	L. D.	F	19	Hysterop.	Ether	Recovery	Durston's op., from vagina
410	E. T.	F	39	Laparotomy	Ether	Death, 12hrs. shock	Hyd., right lobe liver; adhesion to uterus and ovary; many daughter, 4 pints, burst into perit. cavity
411	E. H.	F	23	Hysterop.	Ether	Recovery	Durston's, vaginal
412	E. S. S.	F	26	Laparotomy	Ether	Recovery	Hæmatoma of right ovary; left cystic, double oophorect.
413	A. D.	F	22	Laparot.	Ether	Recovery	Explor. sinus after oophorect. stitched
414	P. T.	F	25	Oophorect.	Ether	Recovery	Double cystic and prolapsed ovaries
415	F. T.	F	45	Laparot.	Ether	Death; perit.	Gall bladder containing many adhesions, and full of gall stones. Abandoned
416	M. C.	F	34	Double oophor	Ether	Death; perit.	Prolapse and adhesns.
417	E. H.	F	29	Laparot.	Ether	Recovery	Double oophor. and reml. of append. Vermiform cystic ovaries, salpingitis, numerous adhesions
418	T. W.	M	49	Laparot.	Ether	Recovery	For carcinoma recti
419	S. P.	M	16	Laparot.	Ether	Death 20 hrs. after admsn	For intestinal perforation
420	C. O.	F	38	Laparot.	Chlor. & Ether	Died on 18th	Carcinoma of ovaries, and sec. deposits, double oophorect.
421	M. K.	F	19	Laparot.	Ether & Chlor	Recovery	Double oophorect.
422	S. B.	F	22	Double oophor	Chlor. & Ether	Recovery	Cystic ovaries
423	L. M.	F	19	Double oophor	Chlor. & Ether	Recovery	
424	E. S.	F	21	For ventral hernia	Chlor. & Ether	Recovery	After abd. section
425	W. S.	M	14	Abdom. sec., left side	Ether	Recovery	For explor. ureter for calculus obstructions. Three calculi removed from left kidney
426	L. W.	F	28	Laparot.	Chlor. & Ether	Recovery	And drainage of pyo-salpinx
427	J. S.	F	25	Laparot.	Chlor. & Ether	Recovery	Double pyo-salpinx oophorect. and hysterect.
428	F. L.	M	51	Hyd. laparot.	Ether	Recovery	Recto-vesl. pouch. Mother cyst disintegrating and ruptured. Numerous daughter and granddghtr. cysts; some of daughter cysts with smaller cysts inside were considerably flattened; walls sodden. Cont. abt. 1½ pints. Capsule stitched to abdom. wall
429	E. G.	F	48	Laparot.	Chlor. & Ether	Recovery	Double oophorect.
430	M. G.	F	38	Appendicitis	Ether	Recovery	Removal
431	K. D.	F	21	Double oophor	Chlor. & Ether	Recovery	Double pyo-salpinx

No.	Name.	Sex.	Age.	Operation.	Anæsthet.	Result.	Remarks.
432	M. S.	F	26	Double oophor	Chlor.& Ether	Recovery	
433	A. E.	F	17	Laparot.	Chlor.& Ether	Death int.	Ovarian cystoma. Weight, 18 lbs.
434	A. A.	F	25	Laparot.	Chlor & Ether	Recovery	Ovarian cyst (Dermoid)
435	G. E.	M	54	Laparot.	Ether	Recovery	Large hyd. cyst left lobe of liver, packed with daughter cysts, contents O.T. x 9 pints, mother and daughter cysts with soft walls
436	S. C.	F	37	Laparot.	Ether	Death	Carcinoma of ovaries ·30 pints ascitic fluid
437	K. B.	F	24	Laparot.	Chlor & Ether	Death	Endo-metritis Perit.
438	C. L.	M	41	Laparot. Explor.	Ether	Died 3 weeks exhaust. and drop.	Enlarged spleen and liver ascitic fluid
439	M. B.	F	50	Laparot.	Ether	Recovery	Hyd. L. lobe of liver mother cyst, no daughter cysts. Contents clear fluid 3 pints omentum adherent to cyst
440	C. E.	F	63	Laparot.	Ether	Death	Carcinoma of gall bladder 16 calculi found at P.M. Peritonitis.

SECTION OF SPERMATIC CORDS FOR HYPERTROPHY OF PROSTATE.

By C. H. Haines, M.D., Auckland.

Since castration for the reduction of hypertrophy of the prostate was introduced by White, of Philadelphia, in 1893, the operation has been performed several times, and in cases of pure senile enlargement with, as far as I can learn, uniform success. As to the *rationale* of the operation, I cannot do better than quote Dr. White. He says: "The prostate, while not embryologically the true homologue of the uterus, was developed from structures quite distinct from those which formed the urinary passages. The structure of the prostate and that of the uterus were strikingly similar. The growth of the organ was in direct relation with the sexual life of the individual; its overgrowth occurred at a period when the sexual life was fading out, but was not quite extinct. The reproductive life ended sooner in the female than in the male, and accordingly we find fibro-myomata appearing earlier in the former than in the latter. The histology of the growths and of their varieties was remarkably alike in the two sexes. The uterine tumour did not appear after the menopause, or, if present, underwent atrophy at that time. After a certain period of life there was no increase in the tendency to enlargement of the prostate, but rather the reverse. In the female, oophorectomy caused a disappearance of these growths and atrophy of the uterus itself. Castration almost certainly had the same effect upon the normal prostate."

A strong case is here made out, and actual experience confirms it. Dr. White also refers to the natural objection of patients to the necessary mutilation, and refers to those who insist on retaining their testicles as evidence of a *virilité passée*. One patient to whom I suggested the operation of castration refused absolutely to undergo it. It then occurred to me that the same end could be attained by division of the spermatic cord. All influence from the glands would be removed, and the subsequent wasting of the testes would hardly be perceived by the patient. Another patient who had suffered for some years from enlargement of the prostate, and whose sufferings had latterly almost incapacitated him from work, consented readily to the modified operation. A similar suggestion has been made, but I have not heard of any case in which the method has been tried, except a bare mention in a detail of cases of castration—"In a fourth case section of the vas deferens gave no definite results."—*Medical Annual*, 1895. Here I presume that the vas deferens was isolated and divided. I will now relate the history and particulars of my case.

Patient, a gentleman, aged 65. His life has been one of physical and mental activity, of good physique, and otherwise in good health. Trouble commenced in 1883, when the catheter had to be resorted to for difficulty in micturition. He was able to pass water comfortably after a fortnight's treatment. Occasional difficulty occurred at intervals. In 1888 he consulted Sir Henry Thompson, who confirmed the diagnosis, and advised regular catheterisation. From August, 1895, the discomfort rapidly increased. Hæmorrhage occurred on more than one occasion. Vesical catarrh was present. In October, 1895, water had to be passed at half hour intervals, active exercise, driving, &c., had to be abandoned, and health was giving way. The prostate was now the size of a medium orange, and the bearing-down sensation in the rectum was very disagreeable.

On November 7, 1895, with the assistance of Drs. Knight and Lindsay, I operated. I made an incision of about an inch in length over the cord, on the right side, cleared it of connective tissue, and tied it in two places about three-quarters of an inch apart, with sterilised silk, removing the intermediate portion. The same was repeated on the opposite side, and the wound closed with gut. This was done with the usual anti-septic precautions, and an anti-septic dressing applied. The wounds healed painlessly by first intention.

On the third day there was a considerable discharge through the penis of dark clotted blood, and there was a heavy gelatinous deposit in the urine.

On November 15 he slept for four hours for the first time for several months.

On December 3 and 13 there was some hæmorrhage, but there has been none since.

With the exception of slight catarrh of the bladder patient now feels as well as before his trouble commenced. The catheter has only been required on two or three occasions, and then constipation was present. Residual water amounts to 3 drachms, as against 3 ounces before operation. The catheter does not require to be passed within an inch of what was formerly necessary.

The prostate is still large but is considerably reduced in size, and there is a distinct furrow between the lateral lobes. I think it is safe to assume that atrophy is setting in, and that the middle lobe has taken precedence. The testes are much softer, and have lost their characteristic feel.

The patient has resumed his active life, and experiences no discomfort. I am now irrigating the bladder for the relief of the catarrh, and the water is almost free from muco pus.

I regret that I have but the one case to offer, but the results attained are so striking as to justify its repetition. The operation is simple in the extreme, and with proper precautions should be free from risk. A few days confinement is all that is required, and the patient bears no mark of operation.

HYPERTROPHY OF THE PROSTATE.

By J. O. Closs, M.D., ChM. Edin.

Hon. Surgeon Dunedin Hospital.

As this subject has of late years proved a most fertile one for investigation and experiment, both on the part of the pathologist and the surgeon, I have ventured to bring the matter under your notice to-day.

I feel sure that no gland—if gland it can be called—in the human body has ever been submitted to such varied treatment, directly or indirectly, at the hands of medical and surgical therapeutics.

Its pathology has in a large measure been disposed of, but its etiology gives rise to as varied opinions at the present time as it did years ago; while to the surgeon its treatment is of the utmost interest, and it is not settled yet whether he shall attack the gland itself, or treat it at a respectful distance.

If, as Reginald Harrison has said, that "one third of the entire male population above 55 years of age are subjects of prostatic hypertrophy," then it becomes a most serious question what is to be done for its relief or cure. Unfortunately, it is found that subjects of this disease, whose real condition has been overlooked, fritter away their time in useless and sometimes harmful treatment, and are at last driven on account of their sufferings, or on recommendation, to approach the surgeon as a *denier ressort*. It is then that the latter feels himself surrounded by so many theories and practices that he is somewhat at a loss to determine which, if any, operation he shall adopt. I think the great divergence in the matter of surgical treatment is in a large measure due to the dis-association between the etiology and pathology of the hypertrophy. I feel sure that if the relationship between the enlarged gland and its cause were better understood, its treatment would stand on a more rational basis than it does at present. Unfortunately, the knowledge of this relationship is still mysterious, and frequently only a problematical cause can be suggested, which may or may not be the true one. The history of the patient is one of the best guides—if not the only one; mere physical examination will yield little information, except its size, and some idea of its consistence.

Of late some have assigned as a cause of the enlargement, an excess of virility. How far that theory is correct is at the present time impossible to say; still there can be no longer any doubt but that the prostate gland in some way or other is closely connected with the sexual system, and as such serves some other purpose than what has been usually assigned to it in its connection with urination.

Arguing, however, against such hypothesis, the opponents of this theory say that enlarged prostates are found in men who have lived most careful and continent lives, also that many who have gone to excess in every indulgence have never suffered from any prostatic trouble in the least.

All this may be perfectly true, but it proves nothing in particular, except that virility is not a universal factor in the cause; but I am of opinion that this, in certain constitutions, is a factor to be reckoned with; while in others it must be largely discounted, or entirely excluded from the etiological table.

It appears to me that any condition of affairs that causes a local irritation of the gland, whether it be occupation, difficult micturition from any vesical or urethral trouble, or virile excess, in certain constitutional diatheses, will lead to hyperplasia and enlargement of the organ. Those constitutions that are prone to take on this condition of the gland may, I think, fairly be considered as belonging to the rheumatic and gouty type, with atheroma of the vessels. I do not for a moment wish it to be understood that enlarged prostates are not to be found outside this type of constitution, but I believe that in the majority of cases it acts as a matrix as it were for the development of the pathological condition. We know that whatever the cause of the hypertrophy may be, the pathological changes in the gland are those simply of degree, leaving out the presence of tumours, cysts, calculi, &c. The difference being in the distribution of the glandular and stromatic tissues. The more stroma, the more fibrous tissue, the harder and firmer the gland will be.

It might also be assumed, and argued by the supporters of the virile factor as the cause, that on account of the anatomical relationship of the prostate to the vesiculæ seminales and ejaculatory muscles, that the lateral lobes of the gland shotlld be the ones enlarged, and, as a rule, this is so. The middle lobe, if it exists at all, is merely an increase of some prostatic tissue at the neck of the bladder, giving rise to what is now known as the prostatic bar. The lateral lobes blend into this, and support it in a somewhat unyielding position, and is principally the cause of all the miserable disturbances that accompany this disorder. The lateral lobes, however, being the larger in the normal condition, would remain so when the gland enlarged from general hyperlasia, even if a middle lobe were present, and this enlargement may or may not have been assisted by whatever muscular action it may possess being called into play.

The symptoms of this disease are pretty well known to you all, they vary in degree, both the subjective and objective.

The subjective symptoms, which are very numerous, and which are common to a great many troubles of the urinary system, can only be taken to support the information obtained by physical examination. This must form the diagnostic basis in every case.

Different men have different ways of examining the prostate. To my mind the best position for the patient to be placed in is the perineal lithotomy one; then, with a finger in the rectum and a Thompson's sound in the bladder, the examination becomes a recto-vesical one, the sound in the bladder acting as the other exploring and opposing finger. By this means a very fair idea can be formed of the dimensions and position of the hypertrophy. Mere digital examination per rectum is not sufficient. Not only does it not give sufficient information regarding the hypertrophy, but in some cases, in which the middle lobe is not enlarged, or does not exist, and where the lateral lobes are enlarged vesically, the exploring finger may entirely miss the true condition of affairs, and an erroneous conclusion be arrived at, both as to the morbid condition of the gland, and the mode of treatment that should be adopted. On the other hand, there are cases of enlarged prostates that as soon as the exploring finger passes through the sphincter ani, it impinges on a tumour, which may be due to any one, say, of the numerous pathological states or conditions that this gland is capable of taking on. This, together with some idea of its dimensions and consistence, is about all the information that can be obtained by such an examination. Nor is the mere passage of a sound into the bladder sufficient to make clear the true condition of the gland. It certainly may detect the presence of a stone, or a painful and thickened condition of the bladder walls, but is useless in giving a true estimate of the enlargement. In a word, I consider any one of these modes of examination, in itself, as perfunctory, unscientific, and misleading; but when taken together, and in conjunction with the subjective signs usually associated with this distressing malady, a very fair idea of the true condition of affairs can be arrived at. I will endeavour to illustrate what I mean by two clinical cases that have come under my immediate notice, as bearing on this and other points of the disease.

The first case was aged 56, a widower for five years, carpenter by occupation. Had suffered from the usual frequent and painful micturition which is associated with this disease for over two years. For the latter half of that time he had used a gum elastic catheter to void urine, but ultimately this failed to give any relief. He had the rheumatic diathesis, and well marked atheroma of the vessels. Examination per rectum revealed an enormously large mass occupying the position of the prostate, pressing on the rectum, and extending from one ramus to another, so that the exploring finger was unable to define its limits in any one direction. With the sound in the bladder, the prostatic mass was found to possess an elastic hardness, and was very thick. The floor of the prostatic urethra did not appear to be unduly diverted from the normal curve; but immediately beyond this there was a distinct dip, giving rise to the prostatic bar. The walls of the bladder were very sensitive, and the rugæ were hypertrophied, the urine was alkaline, and contained pus; no stone was detected. Perineal prostatectomy was performed in March, 1893. I preferred this method on account of the great size of the mass to be removed, and to provide for free drainage: also, what decided me most of all, was the weakened and broken-down constitution of the patient. The incision I made, in order to get plenty of room, extended from each ischium to a point immediately below the pubes.

A somewhat triangular flap was thus made, and dissected down as far as the fibres of the sphincter ani. A deep dissection was then pursued till the capsule of the prostate was reached. The anterior wall of the rectum was well separated from this, and after the capsule was incised the whole of the enlarged prostate was removed in two portions. A part of the neck of the bladder and the prostatic urethra were torn away, leaving a rent in the bladder capable of admitting two fingers, and allowing easy exploration of that viscus. A No. 12 silver catheter was passed down through the urethra into the bladder and its torn edges were brought together as well as possible, the catheter was removed, and a drainage tube placed in the lower angle of the wound in the bladder, and brought out through a drainage hole in the base of the perineal flap, the skin wound was brought together by horse hair sutures. The weight of the gland removed was 2 ounces and 3 drachms fully.

The next morning after the operation it was found necessary, on account of severe hæmorrhage, to undo several stitches in the right side, and plug the wound with carbolized gauze, and place a "Barnes'" bag in the rectum; this had the desired effect. With a few ups and downs in the course of after treatment, the patient ultimately made a splendid recovery. The external wounds were all healed in about a month; but where such an amount of cicatrisation is sure to take place, the danger of a traumatic stricture at the neck of the bladder is great. To prevent this it was necessary to pass catheters for some considerable time after the healing process was complete.

The sequence of this case is interesting. For nearly two years after prostatectomy he enjoyed excellent health, and was able to follow his trade, then he began to suffer with symptoms similar to those he had previous to operation. When admitted to the hospital again he had all the symptoms of cystitis, with a deal of pus in the urine; his bladder was on several occasions sounded for stone, but none could be found. He made no progress under palliative treatment. His bladder was too sensitive to allow the presence of a soft catheter for syphon drainage. Perineal median cystotomy was performed to give relief, and provide for free drainage.

It was then that a soft, phosphatic stone, somewhat of a dumb-bell shape, was found firmly wedged in behind the pubes. This was removed, and the bladder douched out, free drainage was provided; the urine, however, never improved, and the sides of the wound became encrusted with phosphates. He became paralysed on the right side, and totally blind in the right eye, got quite childish, and died from septic absorption.

The question might be asked, Was there any stone there at the time of the first operation, two years previously? I can emphatically answer—none. It was the easiest matter with such free incisions to explore the bladder thoroughly, which was done, and the only rational explanation is, that during the healing process, and while a low level passage was being established with the aid of the catheter, a retro-pubic pouch was formed, which afterwards seemed to lodge the nucleus of the stone which gave rise to the second operation. As the stone became too large for the pouch it grew outwards into the bladder, and this end assumed the larger proportions, as is indicated by the shape of the stone and nucleus.

It is not surprising that the stone was missed during the sounding process, for one does not expect to find it pouched into the anterior wall of the bladder behind the pubes. It may be argued that a supra-pubic operation would have been best to remove the stone, undoubtedly it would; still, considering the state of the bladder and urine, a perineal boutonnière would have to have been done, and through and through drainage established. Nothing therefore would have been gained by adopting it, as the perineal wound was sufficient for drainage purposes, and the bladder could be douched, as was done, by means of a catheter passed through the urethra.

I would ask your attention to another clinical case, happier, so far in its results, but certainly not more interesting than the one just related.

A. B., age 61, married, has been occupied in farm work from his boyhood, possesses the rheumatic diathesis and atheromatous; but otherwise strong and healthy. He came into the hospital a year ago last November, suffering from the usual subjective symptoms that accompany hypertrophy of the prostate. The rectal examination revealed slight enlargement of the left lobe, and the right one even less. This evidence, you will notice, is in striking contrast to what was found by the same method of examination in the preceding case, which revealed an enormous hypertrophy per rectum. On passing the catheter, however, it was evident that the prostatic urethra was twisted, and in order to enter the bladder it revolved to the right about a quarter of an arc of a circle. By this instrument, and a finger in the rectum, it was easy to demonstrate that there was considerable vesical enlargement of both lobes of the prostate.

This is a clear case in which a true diagnosis might easily be missed by mere rectal examination, and even without a careful search with the catheter, for that instrument, when guided along the curve of the urethra, found its own way into the bladder without any difficulty. With regard to the length of the urethra in prostatic enlargement as an objective symptom, according to my experience, I would not be inclined to place much reliance upon it. We know that urethræ vary considerably in length in normal conditions, which must discount it as a diagnostic symptom in disease. The only true signs to my mind to be relied upon are those acquired by the combined recto-vesical examination. Any other symptoms, subjective or objective, must be taken for what they are worth. Supra-pubic prostatectomy was performed on this case, and immediately the finger entered the bladder, the first thing it touched was the left lateral lobe, the right lobe smaller, lay close to it with the twisted urethra between, both lobes were much larger than was previously thought. The mucous membrane was incised over each lobe, and they were removed by evulsion. The patient made an excellent recovery, and is to-day perfectly well and able to follow his usual farm work.

The technique of the after treatment in these cases cannot be very well described—unremitting care and attention is required, both on the part of the nurse and surgeon.

Each of the cases I have related is in illustration of the two methods of performing prostatectomy—the perineal and supra-pubic.

The first case, however, is quite different in the method adopted to reach the prostrate gland from that laid down as the standard operation. The incisions I adopted practically correspond to the transverse one now recommended by Kocher in his "Text Book of Operative Surgery, 1895," extending from ischium to ischium, following the curve of the ramus and pubic bones. This operation I performed in 1893. The only difference is that Kocher's is a little more rounded on the apex—in every other respect it is practically the same incision. After reflecting down the perineal flap, it is an easy matter to pursue the deep dissection till the gland is reached. I can speak for the excellency of the method; but that it will ever take the place of the supra-pubic method, will depend much on circumstances, not the least of which may be, that some day the gland, or sufficient portion of it, will be removed without injury to the vesical mucous membrane.

Supra-pubic prostatectomy with perineal drainage, has much to recommend it in old and debilitated subjects with chronic cystitis, and ropy urine. In such cases, I am aware that some would recommend the use of soft catheters and other palliative measures.

This method of treatment is all very good, where operative treatment is out of the question, and where there could be nothing else expected but a fatal issue; but to submit a patient to a life of catheterisation, which any day may introduce septic material, and which will certainly give rise, not only to most distressing symptoms, but will endanger life itself, is putting off the evil day to a time when it is useless to hope for a successful issue.

With respect to the opinion that is held by some as to the formation of fistulas as a sequence to the operation, is in my mind grossly exaggerated. With free and careful use of soft catheters, after the cystitis has subsided. and during the healing process, any attempt at the formation of a fistula can, as a rule, be easily overcome.

The last point I wish to touch upon in connection with this subject is its relation to castration. A little over two years ago Professor White, of Philadelphia, promulgated the theory that the prostate gland speedily atrophied after the testicles were removed. He proceeded to carry this into practice, and his example has been followed by other surgeons in different parts of the world. Some claim success, perhaps most of those that have done it do so, as far as the atrophy of prostate is concerned, while others that have tried it disclaim its usefulness on account of the grave psychological effects that frequently ensue. I have never performed White's operation, and I have not seen sufficient cases in which it has been done, to speak with any definiteness on this point. But reasoning from analogy it seems to be one on all fours with Hegar's for fibromata of the uterus. which operation, as you know, is to bring on the menopause, and no gynæcologist would deem it necessary to perform this operation after the menopause was reached. But supporters of White's operation argue that the subjects on whom this operation is likely to be performed, are old and debilitated, and their testicles are effete. If they are effete, what harm are they doing, any more than the atrophied ovaries of a woman with fibromata, when the menopause is reached. It appears to me that if this operation is to do any good, it should be done on subjects of hypertrophied prostate, and in whom the testicles are not effete. For it must be considered by the supporters of White's operation that there is a physiological connection between the prostate and the testes, but hitherto we have been unable to say what the true relationship is. If the theory holds good that virility has to do with the enlargment of the gland, why does it not atrophy when virility has ceased, avoiding the necessity of castration? Of course I know that this is open to the question, When does virility really cease, or even when it has apparently ceased, may there not be some physiological connection between the testes and the glandular hyperplasia? There may be, but more knowledge is wanted on the subject to place White's operation on a sound and scientific basis.

The same objection must be taken to those who would divide the vasæ deferentiæ for the same purpose as removal of the testicles. Also Bier's operation of tying the internal iliac arteries, is but another copy from gynæcology applied to a gland the real physiological action of which is not yet thoroughly understood. Truly surgery has revolved in cycles round the enlarged prostate, and is an outcome of a growing tendency in some quarters to act on synthetical construction rather than wait for a true analysis. At the present state of our knowledge on this subject of hypertrophied prostate, I fail to see the necessity of dismembering one portion of the body for the cure of another until their true connection is made plain, and that the after results will be satisfactory. As Lydston recently writing on this subject puts it, there is a "grim humour in the new procedure; the oophorectomy craze of the past is still a vivid recollection."

White's operation, however, in many cases appears to have done good, as far as the gland itself was concerned. Statistics are wanting to show what the after effects are. Sufficient cases, however, have been related to indicate that grave psychological disturbances frequently follow this operation sooner or later, and if only the half that is told be true, then I am afraid White's operation can never become a standard one.

I trust that I have in some measure succeeded in my endeavour to lay before you some of the different theories and treatment that surround this most interesting subject. There is a wide field yet for experiment and research before the surgeon, and he who reduces the risk of operative measures with an equal certainty of success, will have earned the gratitude of a large section of mankind, and will be worthy of an honoured place in the science and art of surgery.

Dr. Church said: Considering the number of cases of enlarged prostate which one meets with, and the great suffering this condition entails, the importance of the subject must be manifest to us all. In a case which I had last year I performed the operation of bilateral castration, and the result was eminently successful. It would be absurd to resort to this operation in every case of prostatic hypertrophy—each case must be treated on its merits. We must remember that our patients are very often between 70 and 80 years of age, on whom a severe operation, such as supra-pubic prostatectomy, cannot safely be performed. Removal of the testes is easily carried out, and even in the aged a safe operation. We have heard of cases of mania resulting from bilateral castration, but in my opinion the mania was not really the result of the operation. Professor White, in his monograph, gives the details of over 100 cases, collected from all over the world, in not one of which did mania occur. If, in a patient with hypertrophy of the prostate, supra-pubic prostatectomy cannot be performed safely, then I consider it quite justifiable to resort to the operation of castration.

Dr. Pinnock said: I operated about 18 months ago on a man nearly 70 years old, who had suffered for three years with the usual symptoms of prostatic hypertrophy in an aggravated form, and had undergone the usual treatments. For three months prior to operation his sufferings were so acute and constant that he threatened to do away with himself if he could not get relief, and his wife was in continual dread of his committing suicide. Five weeks after operation bladder symptoms had improved, and continued to improve steadily. The mental improvement also was marked and immediate. The diagnosis of the enlargement was made by the combined vesical and rectal method, advocated by Dr. Closs in his paper, and as in one of his cases the hypertrophy was so great that its limits could not be made out by the finger.

Two months ago, when I last examined him, the gland was no larger than it usually is at his time of life, and he is living in comfort, and can attend to his own gardening.

I have never done the supra-pubic operation, as in the few cases in which this was suggested the patients would not consent. Probably the dread of loss of sexual power will be the most serious bar to consent to castration in these cases; but as in all other operations suggested by us, consent resolves itself into a matter of personal faith on the part of the patient in his medical attendant. In any case, although I ascertained that my patient exercised his sexual organs much more frequently than his age would suggest, the condition of the removed testes clearly demonstrated that he had possessed no true sexual virility for some time, both organs being atrophied and pultaceous, and on section the normal anatomical peculiarities were obliterated. He has a family, the youngest being 15 years old, and his wife has not passed the climacteric. I have no doubt that many elderly men confuse sexual ability with sexual virility.

I cannot think that castration *per se* produced the insanity in the four cases referred to by Dr. Macdonald. We are all aware of insanity having been stated to occasionally follow many operations, but these operations are still successfully and justifiably practised. In my case a distinctly suicidal tendency was immediately checked by the operation.

I have mentioned this case as one illustrating, in a practical and tangible manner, the benefit of castration in this disease.

Dr. TODD said: I am glad to hear Dr. Pinnock give so favourable a report of Professor White's operation of relief of symptoms due to enlarged prostate. My experience has been even more fortunate than his. Professor White reported 113 cases, with nine deaths. In every instance where recovery took place there was some improvement in symptoms—often very great relief. Castration in elderly persons is not free from risk. I remember one death in the Adelaide Hospital, in a comparatively healthy old man. I believe insanity occurs sometimes in operation on urinary tract. I have had one case of insanity after removal of urinary calculus, and Dr. Marten, of Adelaide, has had another.

TREATMENT OF CHRONIC URINARY FISTULÆ BY CYSTOTOMY AND TRANSPLANTATION.

By J. H. MURRAY-AYNSLEY, L.R.C.P. LOND., M.R.C.S. ENG.

Resident Medical Officer, Christchurch Hospital.

Amongst the diseases in which our treatment is at present unsatisfactory, and in which we are justified in attempting what may be termed experimental surgery, even if that treatment is attended with some risk of life, are those cases of old standing stricture where a portion of the urethra has been destroyed, either by the attempts to pass instruments, or by the rupture of the urethra through the pressure of urine behind the stricture, and extravasation into the perinæum has taken place, leading to the formation of urinary fistulæ, through which the urine dribbles, a constant source of irritation to the patient himself and of annoyance to his neighbours. In these cases the only

BURROUGHS, WELLCOME & Co.
LIBRARY
No.

operation likely to be of use is Cock's external urethrotomy, and in advanced cases of fistulæ even this operation only replaces the numerous fistulous openings by a single fistula in a more convenient situation. In the operation that I suggest, even if it fails, the man would not be in a worse position than having a single perineal fistula, while success would mean the possession of a healthy urethra, and the patient would not be condemned to the life-long use of the catheter, which is necessary after urethrotomy. Remembering that the prostatic portion of the urethra is always healthy, and the penile portion also is usually in a healthy condition, the operation I propose is to unite the two ends of the healthy urethra by means of transplanting an animal's urethra into the intervening space, and uniting the ends of the patient's urethra to those of the transplanted urethra.

A case lately treated in the Christchurch Hospital first gave me the idea of the transplantation treatment, and I will now deal with this case to show you I hope that I have reasonable grounds for my suggestion.

H.W., aged 40, admitted 9th September, 1895, twelve years ago had an attack of gonorrhœa whilst at sea, neglected it, and was not cured until after nine months; two years after had symptoms of stricture, and soon after this, another attack of gonorrhœa; since this last attack has had difficult and painful micturition, causing him to strain; sometimes drops of blood would exude; on admission an elastic-feeling stricture was found about 5½ inches from the meatus. This was with difficulty dilated up to No. 4, but no larger sized bougie than No. 4 could be passed, and the stricture in a few hours so contracted that only a No. 1 could be passed. Repeated attempts at dilation were made, always with the same result. On 9th October external urethrotomy was performed, but the bladder opening could not be found, and, finally, median section of the perinæum was performed, and a tube passed into the bladder through the perineal wound. By 25th October the patient was in the following state:—An open granulating wound occupied the whole of the anterior part of the perinæum; a sound passed down the penis appeared at the anterior angle of the wound, the distance from the meatus being about 5 inches: at the posterior angle of the wound was the opening to the bladder, kept patent by a catheter, the intervening space being filled with rapidly contracting granulating tissue. The bladder, through irrigation with boracic acid solution, had been got into a healthy state, and the man's general condition was improved; but about 1½ inches of the spongy portion of the urethra, the whole of the membranous portion, and a small part of the prostatic portion were entirely lost. It was evident that unless the intervening portion of urethra was in some way replaced the man must for the rest of his life remain with a perineal fistula.

Dr. P. Clennel Fenwick, who at that time was assistant resident medical officer, suggested that an animal's urethra might be transplanted to fill up the gap Dr. Nedwill, the visiting surgeon in charge of the case, having consented to the operation, a sheep was procured, and the operation performed on October 25. A groove was made along the middle of the perineal wound by Dr. Fenwick, under cocaine, all hæmorrhage carefully stopped, then the sheep was chloroformed and its urethra dissected out, at once put on a warm antiseptised plate; Dr. Fenwick then passed a catheter into the urethra, slipped the sheep's urethra over the end of the catheter, and having placed the ends in approximation, united them by fine catgut sutures, the catheter was then passed carefully on into the bladder, and the edges of the perineal groove brought together over the sheep's urethra by horse hair and salmon gut sutures. An opening was left at the posterior angle so that in case of failure we should easily find the bladder opening. I regret now that this was done, for although the sheep's urethra took perfectly, and by 26th December a No. 12 catheter passed easily up to the prostatic portion of the urethra—*i.e.*, right up to the termination of our new urethra; and if a firm pledget was placed over the small fistulous opening the man passed urine freely through the penis; yet the small opening has proved most difficult to close, and the granulations above this opening threaten to form a spur covering the prostatic end of our transplanted urethra. However, we were trying a perfectly new operation, and had no data whatever to guide us as to the possibility of success. It is now proposed to add another piece of urethra so as to carry the tube on to the neck of the bladder, and fix it there. We may take it as proved that an animal urethra can be transplanted, and that this transplanted urethra shows no signs of contraction.

Now, the operation I propose is to open the bladder by the supra-pubic method, pass in a sound through the opening until you reach the site of the stricture, then place the patient's legs in the lithotomy position while an assistant passes a catheter in the ordinary way, cut down on each sound, and by one incision expose the two sound ends of the urethra, then, with a small sharp curvette a groove is made in the perinæum and all hæmorrhage carefully stopped. The transplanted urethra is then slipped on to the end of the penile catheter, which is carefully passed into the bladder, the sound being withdrawn, and each end stitched on to the ends of the patient's urethra by fine catgut sutures, the catheter allowed to remain in situ for four or five days, a drainage tube to be inserted into the supra-pubic opening, which tube I would keep in for fourteen days. The catheter should be passed carefully every day, and the bladder washed through with some antiseptic solution, the supra-pubic opening could easily be closed at the end of a fortnight, and the irrigation kept up through the penis. It may be said, "Why not do Cock's operation, pass a probe down the urethra from the wound to the stricture, and a catheter down the penis, and then proceed as before, afterwards washing out the bladder through the catheter?"

Well, I am afraid of the formation of a spur in the prostatic portion, and Cock's operation is not an easy one; also, I want to get as much of normal urethra as I can; lastly, I have found that the bladder can be more thoroughly washed out by means of a supra-pubic opening than through the urethra, especially where there is a pocket behind the prostate which may contain purulent residual urine, which might trickle along the catheter and so imperil the union between the patient's urethra and the one transplanted, and in these operations the conditions and surroundings should be as perfect, antiseptically, as possible; still, there would be less risk in prolonging Cock's operation into a transplantation operation. As to the difficulties, it may be urged:

1. That the supra-pubic operation is in itself a dangerous one.
2. That in these cases the bladder is often atrophied and difficult to find, and that difficulty is greater, as you cannot distend the bladder by injections.
3. That the bladder cannot be antiseptised, and the risk of an escape of putrid urine into the peritoneal cavity is very great.

To these I would reply—

1. That done with through antiseptic precautions the suprapubic operation is attended with little danger.
2. Here the real difficulty lies, although the operation is easy on the dead body; it, however, could be combated by dilatation of the rectum, and enlarging the incision if necessary.
3. This could be minimised by having a small trocar and catch (like a minature Lawson Tait's trocar) puncturing and securing the bladder with it and washing out with some antiseptic solution.

In dissecting out the sheep's urethra there was one point I noticed whilst performing the operation, and that is that about 5 inches from the meatus the urethra takes a sharp double curve within its outer sheath, and this cannot be straightened, and has to be cut off.

How I performed the operation was to pass a straight staff, incise the skin over the urethra, which can then easily be found lying in loose cellular tissue, from which it can quickly be separated by the handle of a scalpel. hooked out of its bed, the sound of which has been pressed down to the flexure, withdrawn a little, and the urethra cut through just behind the sound, the fleshy tip is then cut off and the outer covering easily strips off.

The sheep took the chloroform, administered by the matron, Miss Maude, remarkably well, and was killed while under the influence of the anæsthetic.

Now, gentlemen, although the operation I propose may seem a novel and complicated one, attended with some considerable risk to life; yet I think when one gazes on the faces of these unfortunates, almost invariably stamped with the misery of long years of both mental and bodily suffering, that any operation is justified that holds out a chance of a cure.

FOUR CASES OF RENAL CALCULUS: THE EFFECTS ON SURROUNDING TISSUES, AND THEIR TREATMENT BY OPERATION.

By John B. Nash, M.D., New South Wales.

In bringing under notice the cases of renal calculus, they seem to me to form an interesting surgical series, which give room on many points for free discussion.

Anterior to the operation, the criticising and discriminating eye of the physician is fully taxed, as renal history amply exemplifies, in arriving at a clear opinion as to the actual pathological picture, which, under the keen-edged blade of the surgeon, will be brought to view.

There are three females and one male patient.

Case 1—Mrs. W., housewife, aged 38 years, Multipara.

For a considerable time she has been suffering from pain and an enlargement in the right lumbar region.

To inspection and palpation there was an abnormal condition, which constituted a well-marked swelling; it was freely moveable, on expiration passing upwards under the costal arch, and on deep inspiration descending as low as a line drawn from the topmost point of the iliac crest horizontally across the front of the belly wall. A doubt then arose as to whether it was renal or hepatic in its attachments, and in order to clear up this the urine was examined chemically and microscopically on several occasions.

In the history of the case, it was stated that it had seemed to disappear and to re-form and be again apparent in the same position, though it was not especially noted that the urine was, during the absence of the tumour, relatively greater than during its reformation; but, when measurements were made, it was found that the quantity passed in one 24 hours was 62 ounces, during a second 24 hours 26 ounces, and for a third like period 23 ounces.

The urine presented departures from the typical healthy secretion in that it was cloudy when passed, and a deposit soon formed. It varied a good deal in colour, especially so if the lumbar region had been much handled, the smoky indications of blood would be very apparent; then, with a few days rest, this would become less and less marked, until it assumed its former cloudy straw colour. A film, described in books on the urine as iridescent, was to be seen on the surface of the fluid, indicative of the presence of phosphate of lime. Albumin was constantly present. A slight ropiness on treatment, with a strong alkali, suggested some pus. The microscope (x450) revealed renal, vesical and vaginal epithelium, pus corpuscles, and red blood discs.

Thus the diagnosis of intermittent hydronephrosis, due to a calculus accumulation in the right renal pelvis, was led up to.

Operation.—The tumour during the week preceding the operation had been well marked; but when the patient was anæsthetised, no tumour could be felt by manipulation, thus there was wanting a special guide as to the situation of the diseased area.

Through a vertical incision 2½ inches from the centre of the lumbar spine, the kidney was speedily reached, the pelvis defined, and an opening made into this, and a calculus found. Its outer layers were soft and broke down when touched, the rest of the stone came out entire; free irrigation of the interior of the pelvis completed the operation.

Two drainage tubes were left in, going down to the opening of the kidney tissue, and some stout gut sutures helped to draw the deep parts of the wound together.

When feeling the kidney at the bottom of the deep wound, a doubt crossed my mind as to whether the hard body felt was this organ or an accumulation of fæcal material lying in the colon: the shape and consistence assisted in deciding the point, also the anatomical peculiarities of the fibrous capsule.

When the small opening was made in the pelvis, it was enlarged by introducing a forceps and gradually opening the blades in several directions. The stone was firmly held in its position, and it required some manipulation and the snipping with scissors of fibrous material before it could be freed. It was necessary to ligature some venous openings in the margin of the incision in the kidneys; but there was no arterial bleeding.

Progress of Case.—The wound was freely irrigated with boracic acid solution; iodoform at first, and then boracic acid, dusted on, and the tubes gradually shortened, until they were left out at the end of the third week. The urine ceased to flow along the wound at the end of the first week, and it gradually increased in quantity, passing by the normal channels. She had pain for a few days. There was at no time any pus in the wound, and when the last piece of tube was removed it only took a few days for the skin margins to unite and form a firm cicatrix.

At the present time her health is excellent; both generally and in regard to her urinary excretion; ten months after the operation.

Case 2—E. G. T. J., labourer, aged 38 years, married.

Up to eighteen months ago he was in good health, since then he has been troubled with "a pain in his back."

When an examination of his abdomen was made, it was evident that he had an enlargement in the right loin, deep in the region of the kidney. With inspiration the swelling came downwards under the fingers, and it slipped up when expiration was effected. The urine persistently contained much phosphate of lime ($Ca_3 \, P_2 \, O_8$). At times the fluid immediately on being passed was seen to have much white flakey material in it; this, on chemical examination, was found to be the earthy salt, the flakes were very numerous, especially after an examination of his side by palpation.

This unusual condition, together with the pain and the situation of the tumour, led up to the diagnosis of calculus accumulation bearing some relation to the right renal pelvis.

There was at no time any albumin or trace of blood in the kidney secretion.

Operation.—The vertical incision 2½ inches from the lumbar spine was used. To give more room, it was converted into a T by a transverse cut at the junction of its middle and lower third.

When the structures over the kidney had been freely divided, there was some delay in mapping out the organ with the fingers, chiefly owing to its mobility upwards and downwards with the respiratory efforts. In order to fix the kidney, to gain more definite information, a curved needle was passed through a portion of it; this, as soon as it had to a short distance entered the kidney tissues, allowed of an escape of white flakey material, which was immediately recognised as similar to the phosphate of lime which was passed per vias naturales in the urine. A small incision on the line of the needle track, followed by dilatation with a Spencer Wells' forceps, allowed several ounces of the white flakey material to flow away; the tumour was found to have disappeared. A digital examination of the cavity failed to find any solid calculus mass. A similar proceeding with a metal sound, passed in various directions, met with a like result. It was necessary to scrape from the wall of the sac several layers of the white scales of the earthy lime salt. A free irrigation of the incised parts with boracic acid solution was then resorted to: two large drainage tubes left in it, and the wound approximated with deep and superficial sutures.

The main difficulties during the operation were—

1. The determining the exact position of the kidney as it moved freely with the respiratory efforts, and, strange as it may seem, it was not easy to define the enlarged area with a finger in the depths of the incision, and a hand on the belly wall.
2. The depth of the loin, which necessitated the first incision being enlarged in T fashion.

Progress of Case.—For the first two days he had vomiting, and pain over the renal region anteriorly: his general condition was but slightly disturbed.

Between sixty and seventy hours from opening the renal pelvis urine ceased to flow by the incision, and from this time he passed it naturally.

He rapidly convalesced; no pus formed at any period in the wound, the drainage tubes were slowly shortened, and the wound healed from the bottom. The hightest temperature was below 100 deg. F., and his pulse kept practically normal.

Case III.—Mrs. G., aged 54 years, married, English, multipara, housewife. In the beginning of May of 1895 she came under my care with "a pain in her right side," which had existed for some time. Up to a few years ago she was in the enjoyment of perfect health; she then developed a painful condition in her belly; this gradually progressed until a pointing mass of pus, just below the margin of the liver, and close to the gall bladder, indicated its cause. This was aspirated by her medical attendant, and she improved.

She then went to England, got fat and strong on the voyage, and was in the same state while in England. She returned to New South Wales, and for some time afterwards she did not alter. In 1894 she began to lose flesh, and to go down hill generally. In the beginning of 1895 "a pain in the right side" was troublesome, and it was accompanied by a rapid and feeble pulse, constant elevation of temperature, a history of rigors, and an area of painful sensations to pressure extended from a point on the middle of a line drawn vertically upwards from the anterior superior iliac spine to the lower margin of the ribs, in all directions, but especially backwards to the region posteriorly, which corresponded on the skin to the tissues overlying the surface of the kidney.

Percussion indicated a dulness corresponding to the extent of tenderness, and it was continued downwards with the hepatic want of resonance. There was no evidence of the presence of the ascending colon in front of the pathological site.

The symptoms and physical phenomena pointed to an accumulation of pus in connection with the liver, the kidney, or the ascending colon with its appendix. Its posterior position corresponded to the second-named, while the aspirating of pus at an anterior date from the front of the belly led up to the belief of its being hepatic in origin.

The examination of the urine, when undertaken in a systematic manner, showed that the fluid contained a large quantity of albumin, that this was mainly due to contained pus (though filtration did not clear up), that it most likely came from the kidney or its pelvis, as the urinary passages below this level were not in any way diseased. The persistence of these abnormalities of the excretion, plus the other phenomena, decided upon the diagnosis being that of pyelitis, with a perinephric abcess.

The prognosis in regard to an operation was rendered grave by the persistence of albumin after filtration, and the fact that the amount of urine passed varied from less than 20 ounces to about 40 ounces in the 24 hours.

Operation.—The oblique incision parallel to the twelfth rib was used to cut on to the lumbar fascia. When the knife was run through this tissue pus at once welled up. When the opening was enlarged a considerable quantity of creamy matter escaped. The cavity that contained this material was found with the finger to be continuous with the posterior surface of the kidney, and it ran downwards towards the brim of the pelvis, either under or upon the psoas muscle. When the pus and loose *debris* were removed a point was visible in the renal pelvis, through which pus was oozing. To grasp the margin of this opening with a Spencer Wells forceps was easy, and by passing another pair into it and then opening the blades my finger was enabled to explore for the *fons et origo* of the disease. This was found to be a soft calculus surrounded by what felt like a mass of granulations, loosely connected to some portion of the enclosing membrane. This material was cleared out as expeditiously as possible, and the operation was completed by free irrigation of the renal pelvis, the perinephritic cavity, and the incision. Two large drainage tubes, one being placed against the opening in the kidney pelvis, and the other pushed to the deepest point in the abcess cavity, outside the organ, were left in, and the whole depth of the wound partly sutured.

Progress of Case.—Only once after the operation did her temperature exceed 100 deg. F.; her condition improved daily; the large cavity closed rapidly from the bottom; the opening in the renal pelvis healed in the course of two weeks, and in six weeks she was able to leave the hospital.

Case IV.—Mrs. E. H., aged 25 years, married, unipara, housewife, Wallsend.

Pain in right lumbar region going through from front to back and running downwards to right side of symphysis pubis.

She has suffered in this way for three years, getting much worse during the last 18 months.

An investigation of her different systems left the idea that the most probable seat of the pain was in the region of the kidney, with perhaps an adhesion of omentum to the abdominal wall as a cause of a secondary sensory exaltation at the centre of McBurney's line. When the urine was carefully examined, chemically and microscopically, there were always found indications of the presence of a small quantity of blood; the re-action with ozonic ether was not sufficiently evident to enable me to say that there was blood colouring matter in the fluid, but the red discs under the microscope being constantly present for six weeks were satisfactory.

The leading points for diagnosis were:—(1) The history and severity of the pain. (2) The corpuscles in the urine. (3) The absence of pain while resting. (4) Her apparent good condition as to general health and appearance, with her dread of recurrence of the pain, indicative of the severity of the attack. (5) The absence of visible or palpable pathological lesion.

She was the subject of epileptic seizures. These sometimes were supposed to be rendered more severe by the paroxysms of renal pain.

Operation.—When the anæsthetic was being administered she had what looked like two epileptic seizures.

The oblique incision parallel with the twelfth rib was again adopted, and owing to the kidney being apparently high up under the ribs, it had to be carried upwards to the lower region of the second rib, and here the lumbar artery was cut. It, however, gave no trouble. The peri-renal fat was a distinct layer covered by a delicate smooth glistening capsule. When this was opened the bright clear yellow fatty capsule bulged through it, beneath this was found the bluish layer of the kidney. Palpation between the finger and thumb soon revealed the presence of a hard body, occupying one of the upper and posterior calyces of the pelvis. The tissue over it easily gave way under the point of a forceps, and the stone was removed. I did not see the opening in the kidney, as the organ was so far up.

Progress of the Case.—In her post-operative history there is nothing of consequence to note. She convalesced in due course, and without suppuration in the wound. The incision healed firmly, and she is now—about six months after—in better health than she has been for years. Her epileptic seizures even are said to have been much modified in their frequency and severity.

Cases Considered in Relation to One Another.—The first was a case of hydronephrosis, depending upon the presence of a calculus, which, when formed in the renal pelvis, had failed to pass along the ureter, and by occasionally blocking the water-way, led to serious distension of the enclosing structure, which then formed a fluid tumour, occupying at times the lumbar region, and at others passing up under the liver and ribs, to be hidden both from sight and touch. Variations in the position of the body would appear to be the proximate cause in relieving the urinary block, and the stone becoming displaced from the mouth of the ureter, allowed the fluid to escape into the bladder, and thus remove the palpable indications of an abnormal condition, and afford relief to the patient temporarily; her sufferings recurring when the stone again got into the mouth of the ureter.

In the second case there was a persistent tumour in the loin, which did not vary much in size; yet it must have done so to some extent, as the material which caused it was often noticed in the urine immediately it had been passed into a glass vessel. It would appear that the phosphate of lime ($Ca_3P_2O_8$) must have aggregated into flakes in a calyx, these flakes must have then closed the entrance of this cup into the pelvis, preventing its emptying the contents thereof in the ordinary manner, the urine exuding from the papilla collected in this closed calyx and distended it, the papilla probably atrophied, though not completely, a little urine constantly flowed in, and more phosphate of lime deposited. At times the closing of the calyx gave way and some of the contents escaped; but the tone of the muscular fibres and elastic tissue in the wall of this part of the pelvis having been destroyed, the cavity was not quite emptied, and the same series of events again following one another, the cup became a permanent tumour, situated as described, and giving rise to so much pain as to drive him to seek relief. In these two cases the effect produced on the extra renal tissues would seem to have been an alteration in the tunica adiposa of the organ, as this did not appear as a distinct layer in the incision. May it have been that the presence of the distending and distended parts had led to its atrophy?

It is difficult to assign to this case a place in out nomenclature, it was not an inflammatory (?) condition, for there was no rise in temperature, and no pus formation.

It was an affection of calyx, and not of the pelvis *per se.*

It can hardly be called a stone, for then it should be solid, and yet it was a material ($Ca_3\ P_2\ O_8$) which when glued forms a stony mass; the material which effected this in other cases was wanting, as here we had the lime salt, but not the cement to aggregate it.

The third patient had a suppurative pyelitis, and a perinephric abscess of large extent, the communication for the former to the latter being a small opening in the renal pelvis; or, more correctly, one of the calyces of this cavity; inside this a small phosphatic calculus lay imbedded in a mass of soft granulation tissue, and the pus in connection therewith flowed away by the urinary track, and also poured into the cavity between the organ and the deep layer of the lumbar fascia. How did it come about that we had a large abscess formation, which was manifestly septic in its character?

On ordinary grounds this might be accounted for, but not without much misgiving as to the correctness of the ideas advanced.

A more difficult question to answer is, Why in this case, did a perforation occur in the wall of the kidney, while in the two preceding the same tissues distended to so great an extent?

The *fons et origo* of the trouble would appear to be the calculus, yet why should the sequel be so different?

In this case alone was the patient's life immediately threatened, and she certainly would have died had not operative relief come to her assistance. Once the lumbar fascia was opened there was no layer to be traced anatomically, as there was but a cavity beneath it, and at the bottom of this was the opening into the kidney.

In the fourth case layer after layer could be cut through with precision, till the fibrous capsule of the organ was found, then lying in one of the posterior calyces, was felt a brown, almost circular mass, which led to no extra renal pathological condition, and which by irritation *in situ*, only caused some blood corpuscles to migrate from the vessels adjacent to it. These were unable to produce any effect on the stony material, and escaped past it, thence into the urethra, and finally into the specimen glass, from which the microscope was enabled to demonstrate their presence.

The nerves supplied to the tissue immediately enclosing the stone must be exquisitely sensitive, for the pain was as severe as one could imagine, there was no distension which might cause the atrophy of the end organs, and these were probably in an active condition, and capable of fulfilling to the greatest extent their mission of initiating sensory impressions.

Mobility of the Kidney.—In my first case the movement was so free and synchronous with the respiratory acts that it gave me some trouble to define the organ; a similar state of parts was present in the second patient. In my fourth case the adipose capsule and its contents moved, but not to such an extent. When three out of four cases exhibit this same phenomena is it not likely that the general rule is some degree of movement with the respiratory efforts, equal in extent to the other abdominal contents?

Mr. Hy. Morris, at page 26 of his "Surgical Diseases of the Kidney," says: "The extent of movement varies greatly. A slight degree—*i.e.*, an inch or thereabouts, upwards or downwards, appears not to be rare."

Opening on to the Calculus.—Mr. Hy. Morris writes: "When equally convenient to reach the stone, it is best to open the secreting structure, and not the pelvis of the kidney: the wound in the former heals better than in the latter, and the chance of a urinary fistula is much less."

This would not appear to be borne out by the cases narrated, as in each the pelvis was more or less freely opened, and it healed with facility and within the week; even where the suppuration was extensive, and where the rent in the renal tissue had pus flowing through it for so long, urine did not continue. The healing powers of the wall of the pelvis must, therefore, be active, and not inferior to that of other parts.

Intra-abdominal Pressure.—Any increase in the positive pressure within the abdominal walls causes suffering to a person with a renal calculus, in Mrs. E. H. a pregnancy had this effect, and in the later months the pain was much greater than she had before known. It is easy to imagine how the removal of an abdominal tumour may cease to give relief to pain, if there existed with it a stone in the kidney.

A CASE OF SPONTANEOUS SHRIVELLING OF A CANCER OF THE FOOT.

By L. E. Barnett, F.R.C.S., Dunedin.

Each year or so there comes a boom in cancer cures. Now it is cinnamon; now Chian turpentine; now the famous Mattei remedies; and soon some other nostrum will be placed before the longing people as the cure of cures.

An immense number of people, including those who have cancer and those who think they have, fly to these remedies; and amongst these are always certain cases who, it is strenuously maintained, have been cured or improved. Now, it is well in this connection to bear in mind that the general rule of growth in cancer is like other general rules—liable to exceptions. For sometimes cancer is retrogressive. This is exemplified in the well-known cases of atrophic scirrhus of the breast, and in rare instances a similar atrophic process is observed in other undoubted cancers.

J.A., aged 52, a poor old maid, living alone in a little house in the neighbourhood of Dunedin, noticed in October, 1894, a little lump growing on the left foot. She sought no treatment for this. By-and-by it grew larger and painful. She could not wear either boot or slipper, and was incapacitated from her work. The clergyman's wife in the parish in which she lived found her in this miserable condition, and asked me to visit her, which I did in February, 1895. On examination I found a foul fungating cancer the size f. a mandarin orange, growing from the region between the malleolus and the heel of the left foot. It was somewhat pedunculated. The glands in the left groin were enlarged—one particularly so; but I could not be quite certain (at that time, that the enlargement was more than accountable for by the inflamed and septic complication of the cancer. I tried to persuade the poor old body to go into the hospital, but she firmly declined. She would have no surgical interference whatever. Accordingly I was limited to palliative measures, and instructed the patient how to dress the cancer and keep it sweet. She used Jeye's fluid, iodoform, and boric powder, and boric ointment, and antiseptic wool as dressings, and was soon made more comfortable. I saw her at intervals of a few weeks, and was surprised to find her improving. By June, 1895, she was able to do her house work again, and the cancer of the foot was less than half its original size. I noted, however, that the glands in the groin were steadily enlarging, and I noted, too, that my poor patient was becoming silly. The neighbours had all sorts of stories to tell concerning her eccentric habits.

On 18th October I was called to see the patient, who, it was alleged, had taken a fit, and was paralysed, and unable to speak. I found that this was so, and at once ordered her removal to the hospital. The original cancer of the foot had shrivelled into a mere lumpy cicatrix no bigger than a pea. But many secondary growths had become manifest. There was one on the dorsum of the same foot, several about the integument of the trunk and the glands in the left groin were evidently the seat of large malignant growths. The paralysis was on the right side, and was thought to be due by Dr. Colquhoun, the physician under whom the patient was placed, to a secondary growth in the brain; and this explanation was verified after the death of the patient, which took place on 6th November, 1895. The left hemisphere of the brain was extensively infiltrated by a soft, hæmorrhagic growth involving principally the region of the internal capsule.

In addition to the growths already mentioned, there were large deposits in connection with the uterus and both ovaries.

On microscopic examination the tumour showed the characteristics not of squamous epithelioma—the common form of skin cancer—but of spheroidal celled carcinoma, the cell elements preponderating. Probably it originated in the cells of a sweat gland or sebaceous follicle. The patient herself could give no explanation of the origin of the growth, and there was no family history of cancer.

The surgeon of former days would have looked upon this as a fine example of what was called metastasis. As the primary growth gradually shrivelled away other masses sprang into evidence in various parts of the body.

I have thus briefly recorded the case to show how on occasions an undoubted cancer may wither.

A CASE OF NEPHROLITHOTOMY—REMOVAL OF TWENTY-SIX CALCULI.

By Harry A. de Lautour, M.R.C.S. Eng.

The operation of nephrolithotomy is now not an unfrequent one, and has been performed by surgeons in many parts with considerable success. The points of interest of this case are the length of time during which the patient had been suffering, the difficulty of diagnosis, and lastly the number of calculi removed at the operation.

The short history is: H. E., a farmer, had been suffering for some twenty-five years with occasional pains in the back and abdomen. The exact locality was for a long time difficult to determine. He was about fifty years of age, and lived always a healthy and abstemious life. He had been under treatment in London and other places, and also under my own observation for some fifteen years, without any satisfactory result. He was able to attend to his business well, except when occasionally he was prevented by an access of pain. And this pain was generally referred to the coccyx. I frequently tested his urine, but could find nothing wrong, although he himself stated that he had sometimes found albumen. In 1894 the pain became more persistent, as a back-ache. In October of that year, after a long ride on a rough horse, he again consulted me. The pain was then more in the right renal region, and I found albumen and blood in his urine. I then suspected the presence of a renal calculus. Other opinions, however, did not coincide with mine; and it was not until several other accidents, each accompanied by haematuria, that I at last got permission to operate, and explore the right kidney.

The operation was performed on 1st May, 1895, with the assistance of Drs. W. Brown (Dunedin), Garland, and Whitton (Oamaru).

The operation itself was performed in the usual way, with a lumbar incision, and does not call for much comment. On reaching the pelvis, I found a number of small calculi—which I removed with a lithotomy scoop—about twenty-six in number. I then asked Dr. Brown to examine the condition. He found another larger stone, and removed it. A large rubber drainage tube was inserted: the wound dressed. The after treatment was in the ordinary direction. The patient made an excellent recovery, and is now busily occupied attending to his harvest work.

The largest calculus weighed 95 grains.

SHORT NOTES OF CASES OF INOPERABLE CANCER

Treated by injections of the Toxines of Erysipelas and Bacillus Prodigiosus, and by allied methods.

By George Cleghorn, M.D. Durham, M.R.C.S. Eng., Blenheim.

In December, 1893, I had under my care a case of epithelioma of the bladder. The disease had invaded the surrounding tissues to such an extent that any attempt at removal was out of the question. Dr. Coley, of New York, had just published an account of the results he had obtained in the treatment of inoperable cancers by repeated inoculations of erysipelas, and, failing to find a case of erysipelas, I determined to try the effects of injections of infusions of mouse excreta, which Senn, in his "Principles of Surgery," points out produces a disease very similar to erysipelas. Six pellets of mouse excreta were shaken up with half a drachm of sterilised water, and allowed to stand for 24 hours. An injection of ten minims of this fluid was made into the tissues of the thighs every third day. A rise of temperature varying from two to five degrees followed in about six hours, and a hard red painful tumour of the size of a small walnut appeared at the site of the injection within 24 hours. This swelling appeared as if it must break down and suppurate, but subsided in a few days without doing so. The progress of the disease was apparently uninfluenced by the treatment, though the patient used to consider he derived benefit from it, and insisted on its continuance till his death.

. The next case in which I tried this treatment was one of inoperable cancer of the uterine cervix and vagina, in which hæmorrhage was a marked symptom. This patient received six injections in three weeks. The constitutional and local reactions were similar to those in the previous case. The hæmorrhage ceased, and did not return during the further progress of the disease. The patient went to her home in the country, and could not be induced to come back for examination, as she was convinced she was cured. A year later she sent for me, and I found that the disease had spread considerably, and three months later she died.

The next case was one of epithelioma of the lip and lower jaw, involving the glands of the neck, which formed a very large tumour. Injections of ten minims not producing much reaction the dose was gradually increased to 20 minims. These injections were made into the tumour in the neck and over the lower jaw, and after the larger doses the temperature would rise to 103 deg. or over. Owing to the very septic condition of this case, it was difficult to differentiate between the rise of temperature due to the injections and that which occurred independently of them. On the evening of the day on which he received the last injection, he had a rigor, his temperature going up to 105 deg., and continued high till his death five days later. The immediate cause of death was pneumonia, but whether caused by the septic condition of his mouth, or by the injections, it is impossible to say. During these last few days the tumour in the neck entirely disappeared, and the ulcerated surface on the lip and jaw contracted and became very pale, the large florid granulations shrivelling up till the surface looked almost smooth. Whilst this case was under treatment I had the opportunity of securing some fluid from a blister in a mild case of facial erysipelas. Two injections of 20 minims of this fluid were made on successive days, but no distinct constitutional, and no local re-action followed.

In October 1894 I excised the rectum in a case of soft, rapidly-growing cancer, situated high up. Eight months later it recurred in the posterior margin of the scar. This was freely excised, but feeling that the prognosis was unsatisfactory, I wrote to Dr. Coley, asking him for a small quantity of the toxines of erysipelas and bacillus prodigiosus, with which he was obtaining such promising results in the treatment of inoperable cancers. He very kindly replied to my application by forwarding through Dr. B. H. Buxton, of New York University, half an ounce of the toxines. Three months after they had left the hands of Dr. Buxton, I injected 5 minims into a portion of the growth which had again recurred, a hard nodule in the perinæum. This was followed in half an hour by vomiting, a severe rigor, and a temperature of 105. Six hours later the temperature was normal, and the patient ate a good meal, and was in particularly good spirits. After this the dose was reduced to 3 minims, which was followed by a more moderate re-action, which never lasted more than a few hours. The injections were continued three or four times a week, the nodule diminished in size; but a large abscess formed in the pelvis, and he gradually sank, and died 4 months after the commencement of the treatment.

The results as to the cure obtained in these cases are not encouraging. In the third case the tumour in the neck completely disappeared before death, and in the last case the nodule certainly diminished in size; but the effect on the mental condition of the patients was excellent. They felt that though the chances were greatly against them, that still there was a glimmer of hope in view, and that a real fight was being made for their lives, instead of having to abandon themselves to passively await an inevitable doom.

Dr. Coley, in the *American Journal of Medical Sciences* for July, 1895, reports results which are decidedly encouraging. In twenty-five cases of sarcoma the growth had entirely disappeared in six cases, and there had been no recurrence in these cases for periods varying from three years to that of a case which was still under treatment. In nine cases there had been marked improvement; in eight cases slight temporary improvement; and in two cases no result. In eight cases of carcinoma there was improvement in all but one case, and in one case the growth entirely disappeared, but recurred two month later. In eight cases of malignant tumours associated with true erysipelas, there was entire disappearance in one (sarcoma), with no recurrence for seven years; in four slight temporary improvement; in one no result; and two cases died, one on the fourth day and one on the sixth day. Dr. Coley especially points out that toxines obtained from any but virulent cases of erysipelas are of little value, and that the success he has obtained is largely due to the combined action of the toxines of the two germs. This method of treatment is yet in its infancy, and though no other observers have yet reported cases which can compare with Dr. Coley's, his success must encourage others to persevere and possibly improve the present results by careful experiment and research.

A CASE OF SARCOMA OF THE FEMUR

In which complete cure occurred after incision and removal of portions of the growth for microscopical examination.

By George Cleghorn, M.D. Durham, M.R.C.S. Eng., Blenheim.

J. R., 15, a strong healthy lad, with a good family history, consulted me on 27th March, 1892.

Six weeks previously he had been kicked on the left thigh by a horse. The bruise was painful for a few days, but he had since been able to do his work on his father's farm, and even to play football. For a fortnight he has gradually been losing power in the limb, and there is a considerable, fairly uniform, solid tumour, involving the whole shaft of the left femur. Under an anæsthetic the outer surface of the femur was cut down upon, and some pieces of the growth gouged out. These were forwarded to Dr. Roberts, lecturer on pathology at the Otago University, who pronounced the growth to be an osteo-sarcoma. As Dr. Roberts happened to be out of town some delay occurred in obtaining his report, and in the meantime the tumour was found to be steadily disappearing, and two months later no trace of it could be found even by the most careful measurement. The lad has continued in perfect health up to the present, more than four years since the accident.

The delay in obtaining the pathologist's report was a fortunate occurrence for the patient, for in the face of the clinical and microscopical appearances nothing short of amputation at the hip-joint could have held out any reasonable prospect of cure. The result in this case resembles that which occasionally follows on exploratory incision of the peritoneum where a malignant growth, impossible to remove, is found. The occurrence of such cases enables us to give a glimmer of hope, where it is much needed, to the unfortunate sufferers from inoperable cancer, and one such case would be sufficient to establish the reputation of any quack remedy, and ensure a fortune for its proprietor.

A SIMPLE BUT EFFECTIVE APPARATUS FOR THE TREATMENT OF DISLOCATION OF THE ACROMIAL END OF THE CLAVICLE, UPWARDS AND BACKWARDS.

By Harry A. de Lautour, M.R.C.S. Eng., Oamaru.

This accident, which should be more correctly termed, "Dislocation of the Scapula from the Acromial End of the Clavicle," is one of the most troublesome cases we have to deal with in practice. And this for several reasons. As a rule there is no other injury, and the patient soon frets under the confinement necessary to keep the parts in proper position. After the first few days, in the absence of other injuries, it is impossible to keep the patient in bed. Without perfect rest in bed and proper appliances, the dislocated bones cannot be kept in positiom. Again, beyond the uselessness of the limb, after the first shock has passed, there is nothing to remind the patient that there is anything the matter with him. It is a very different question in injuries of the soft parts; the effusion and pain and swelling of themselves give an indication that the treatment is necessary; but in this accident there are no soft parts. The swelling soon goes down, and the pain also. The shallowness of the articulation has also to be borne in mind.

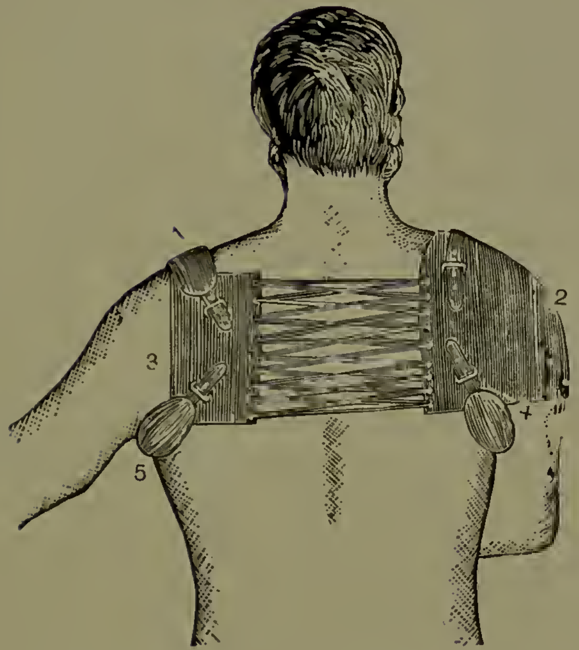
What is practically required is an apparatus which will keep the parts in position and allow the patient to follow his occupation as speedily as possible, and with the least possible inconvenience.

I am pleased to think that I have devised a simple apparatus which will, in the hands of any surgeon, accomplish these objects. It is, however, necessary to bear in mind the dictum of that great surgeon and authority, Hamilton ("A Treatise on Fractures and Dislocations," by F. H. Hamilton, New York). "As to the maintenance of the bone in the socket for a length of time sufficient to insure a firm union of the broken tissues, this will be found always more difficult, and in a majority of cases, absolutely impossible. Nearly all surgeons who have written upon this subject have made the same observation; and if occasionally a new apparatus in the hands of a clever surgeon has seemed to promise better results, the same apparatus in the hands of equally clever surgeons, and under circumstances equally favourable, has been found almost constantly to fail; and we have been compelled again to exercise anew our ingenuity, and to seek for new resources, or to abandon the effort in despair."

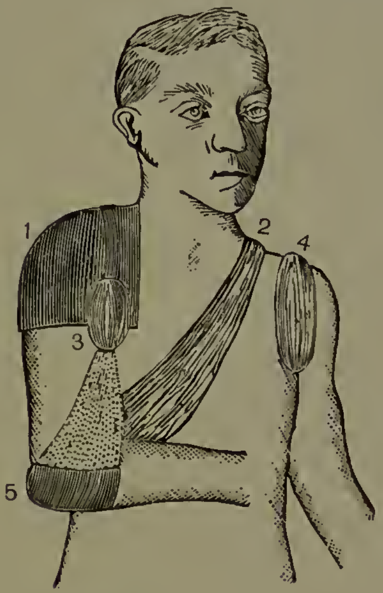
When the dislocation is complete and the end of the clavicle projects for more than half an inch, the coraco and acromio-clavicular ligament are ruptured or greatly stretched. The deformity ensuing is caused in a great measure by the tilting up of the clavicle by the trapezius; but also, and I consider principally, by the weight of the arm itself, assisted by the forward and downward action of the powerful pectoral muscles.

According to Hamilton the most important part of the treatment is to counteract the trapezius by straps or compresses over the outer end of the clavicle, coming down over the point of the elbow. He describes many kinds of apparatus for this purpose. He points out, however, that the practical

BURROUGHS, WELLCOME & Co.
LIBRARY
No.



1—Upper part of opposite Axillary Pad.
2—Leather Shoulder Cap.
3—Leather Counterpoise.
4 Axillary Pad.
5—Opposite Axillary Pad.



1—Leather Shoulder Cap.
2—Inner Fold of Sling.
3—Axillary Pad.
4—Opposite Axillary Pad.
5—Outer Fold of Sling (Cut Short in Drawing).

difficulties are in the sensibility of the skin at the point of the elbow, and the even greater sensibility of the skin over the end of the clavicle, and the consequent inability of these parts to bear the requisite pressure. He also alludes to "the impossibility of fixing the scapula."

I do not myself attach so much importance to this compress, for I find that during sleep the head is generally inclined toward the injured side, so as to relax the trapezius muscle, and I find that an ordinary sling worn outside the shirt is quite sufficient support for the elbow, and in conjunction with the rest of the apparatus is quite equal to the task of keeping the acromion process up to the end of the scapula. This seems to me the important object, not to try and bring the clavicle down to the scapula, but to bring the scapula up to the clavicle, and then keep it there. For in such cases the clavicle is (excepting the action of the trapezius) a fixed element; whereas the dislocated shoulder is a moveable one. Naturally it would appear that the moveable element is the one to which the greatest amount of attention should be directed. In the daytime I find that in addition to the support provided by the elbow sling, the trapezius is sufficiently controlled by the action of the trouser brace tightened up for about half an inch, passing over the end of the clavicle.

To counteract the pectoral muscles, and also to fix the scapula firmly, I mould a piece of sole leather over the deltoid, extending back to the spinal border of the scapula; this is kept in its place firstly by a well padded strap going round the axilla, secured to the shoulder piece by buckles; these buckles can be sown on so as to make the apparatus fit either shoulder. As a counterpoise on the opposite shoulder, I attach by a similar padded axillary strap, another piece of sole leather about 4 inches square. Along the spinal borders of each of these pieces of leather are inserted at intervals of nearly an inch hooks, similar to those fixed on boots for quick lacing. The two leather pieces are brought into connection and action by passing a piece of india-rubber tubing or cord backwards and forwards between them, as indicated in the sketch attached. The tension required to be used should not be too great at first, just sufficient to put a strain on the pectoral muscles without any inconvenience to the patient. He will very quickly learn to accommodate himself to the proper pressure; if too tight he will relax it; if too slack he can easily get it adjusted.

Another advantage in the use of this apparatus lies in the fact that after a few days it is worn outside the shirt, and thus there is no excoriation of the skin at either the elbow or shoulder. In the course of ten days or a fortnight the patient can do a little work, after a month he is fairly independent, and merely requires an occasional observation. By this time he has become so accustomed to his apparatus that he would not do without it on any account.

Without enumerating the many cases of incomplete dislocation which have come under my care during the last twenty years, I may mention three cases in which the injury has been severe, and in which the result has been most satisfactory. These cases were all treated by the apparatus which I have described.

Case 1.—E. J., aged 21, a pupil teacher, while playing football some twelve years ago, was thrown back on to the point of his shoulder. On examination the end of the clavicle was found protruding nearly three-quarters of an inch. The ordinary apparatus recommended failed to keep the bones in place. I then devised the apparatus which I have described; it answered every purpose. The accident occurred twelve years ago; and when I last saw him, three years ago, both limbs were equally good.

Case 2.—W. E., aged 46, a farmer, was thrown out of a cart on to the back of his shoulder; he had to drive twenty-four miles afterwards to get advice. When I saw him the same evening, October 22, 1892, the clavicle projected nearly an inch, indeed it was almost through the skin. I applied the same apparatus as in the first case, with the result that in a few weeks he was forking his hay, and afterwards attended to his harvest operations as usual. I saw him a few days ago, and he assured me that the injured arm was, and is, quite as good as the other.

Case 3.—C. P., aged 24 years, a watchmaker by occupation, was thrown down on his back by some larrikins. I saw him shortly after; the clavicle projected more than half an inch. The same apparatus was applied as in the previous cases. Within three weeks he was able to attend to his business; and now, in less than six weeks, he is actively employed. He has very kindly consented to present himself for examination, and he is here for that purpose.

Cases of complete luxation of the acromial end of the clavicle are not common. I am pleased to show such a case.

But what I wish to demonstrate, subject to your approval, is the principle of bringing the scapula—*i.e.*, the shoulder joint, up to the clavicle, keeping it there, and at the same time counteracting the pectoral muscles; and to do this with the least inconvenience to the patient.

A NEW KIND OF TALIPES.

(*Talipes Spasticus*)

By W. Kent Hughes, M.B., M.R.C.S., Melbourne.

In the *British Medical Journal* of December 30, 1893, Dr. Joseph Griffiths describes a case of what he designated as *talipes dorsalis* in an acephalous fœtus. There was a condition of spina bifida from the skull to the mid lumbar region, the spinal cord could not be discerned in any part of its length, but the nerves could be displayed by dissection. The fœtus was in other respects normal and well formed, but the feet were symmetrically deformed, resembling talipes calcaneus, but the heel is drawn up, not down. The foot is sharply bent upwards at the mid tarsal joint, and the toes are flexed. Mesial sections were taken, and are shown in diagram. He states that the bones were well formed and normally ossified. The os calcis was almost horizontal, and the astragalus almost vertical; the hinder part alone of the superior articular surface being in contact with the tibia. The ligaments, especially the calcaneo-scaphoid were lengthened.

The scaphoid rests upon the dorsum of the neck of the astragalus.

The case I am about to describe is that of a child, age three weeks, John Burbage, who came under my care while temporarily in charge of the Orthopædic department of St. Bartholomew's Hospital. He presents exactly the same condition as Dr. Griffiths's acephalous fœtus as regards the feet. In addition, there was marked contraction of the ham-strings on both sides, and also of the long flexor and adductors of the thumb, and the flexors of the other digits. He was also slightly microcephalic, but I have unfortunately lost the measurements that were taken. The joints, other than those mentioned above were freely movable.

The case was at first sight diagnosed as talipes calcaneus of a severe type, but on closer examination it was found that the tendo achillis was very strongly contracted, pulling the posterior part of the os calcis upwards. A prominence was noted on the plantar surface which was considered to be the heel, but was found to consist of the anterior part of the os calcis and astragalus.

In addition to the dorsal-flexed position of the foot anterior to the medio tarsal joint there is a slight degree of eversion. The outer edge of the foot is very pronounced, commencing with a protuberance to the outer side of the posterior part of the ankle a prominent edge continues upwards to the little toe.

The misplaced heel is very well marked, and tilted somewhat to the outer side of the foot, anteriorly becoming continuous with the outer edge above described.

The feet were treated for three months by manipulation and plaster of paris bandages; and there was some improvement, especially anterior to the mid-tarsal joint. Subsequently the tendo achillis in each foot was divided so as to allow the heel to be brought down. During manipulation and adjustment of bandages, firm pressure was made upon the projecting extremities of the os calcis and astragalus; while traction downwards was exercised upon the heel and anterior part of the foot.

As regards the name of the condition I do not consider that talipes dorsalis is sufficiently descriptive, for not only is the foot dorsal-flexed, anterior, and posterior to the mid-tarsal joint, but the toes are plantar-flexed (that is to say, that every muscle of the foot is in a state of spastic contraction), therefore for want of a better I would suggest "talipes spasticus."

As to the cause, I cannot accept Dr. Griffiths's explanation, which is that the most common position of the foot during the later months is one of extreme flexion at the ankle joint. This position from some cause is fixed and unalterable, and contracture of the calf muscles takes place from changes in spinal cord incidental to spina bifida.

It seems purely a muscular affection in Dr. Griffiths's fœtus, the bones were normal and in my case they appeared so, which is evidence, I think, that the condition had not existed for long prior to birth, or else assuredly the plastic tarsal bones of the fœtus in either case would have altered their shape. It cannot of necessity be due to any brain irritation, for Dr. Griffiths's case was acephalus, but perhaps the spina bifida in his case and the cause of microcephalous in mine might have been the exciting agencies.

"Nerve irritation" might well cause spastic contraction, but what gives rise to the nerve irritation?

THE SEQUELS OF TWO CASES OF BRAIN OPERATIONS REPORTED AT THE INTERCOLONIAL MEDICAL CONGRESS OF 1893.

By George Cleghorn, M.D. Durham, M.R.C.S., Blenheim, N.Z.

(1) Mrs D. In this case three operations had been performed for the removal of sarcoma of the brain, which had twice recurred. It is now three and a-half years since the last operation, there is no sign of recurrence, and the patient is able to get about with a crutch, and to perform a large portion of her household duties, though there is still left hemiplegia. She has been twice pregnant since, and has given birth to two healthy children.

(2) In this case the operation had been performed for Jacksonian epilepsy with paresis of the left arm. For seven months there was no recurrence of the fits, but since then they have returned, and his present condition is much the same as it was before operation.

SUB-SECTION OF DISEASES OF THE EYE, EAR AND THROAT.

HYPERMETROPIA A POSSIBLE CAUSE OF OPTIC NERVE ATROPHY.

By Hugh Armstrong, F.R.C.S., Hobart.

Having recently watched two cases in which marked congestion of the discs was associated with low degrees of hypermetropic astigmatism, subsequently followed by diminution of the signs of congestion and the development of appearances strongly suggesting commencing atrophy, and frequently being struck with the marked congestion of the discs that accompanies so many cases of simple hypermetropia, I should be glad to hear the experience of those who have had the opportunity for watching these cases to the last stage.

The first case, a girl of exceedingly healthy appearance, aged 6, was brought to me in August, 1893, for supposed short sight. Retinoscopy disclosed H. As., requiring +2D and +1.5D cylinders, axis vertical for the right and left eye respectively. The discs were then of a full pink colour, V was not recorded at the time, but it was noted that she could recognise people across the street, and with the glasses read well. Six months later with practically the same refraction error, the discs were found to be uniformly pale, with no physiological cups, as though an early condition of atrophy were present. Eight months later still, V was reduced to P L in R, $\frac{6}{36}$ in L, R disc uniformly greyish white, and the left had a similar tint, though less marked.

This is the present condition of V, though the left disc now has a pink crescent between the cup and the margin.

I could get no history of cerebro-spinal trouble, the child had never had a convulsion, squinted or complained of severe pain in the head, never had any of the specific fevers; there was nothing indicative of hereditary syphilis or tubercle, so that I am forced to attribute the changes to chronic congestion of the discs, whether due to the refraction error or a low chronic meningitis insufficient to produce papillitis, one cannot say. The urine was repeatedly examined, but no albumen or sugar found. At one visit I thought I noticed a slight ptosis and divergence of the right eye, but there were no other symptoms or signs to corroborate involvement of other cranial nerves. It may be that the H. As. was a predisposing cause to a low form of papillitis which eventuated in atrophy.

In a second case, a young man, aged 21, with considerable H. As., the discs were of a yellow pink tint, no cups visible, but no apparent thickening of perivascular sheaths in the disc. Six weeks later the left had acquired a suspiciously uniform grey colour, while the right was pinker than usual. Visual acuity was the same in each eye.

It is always a difficult matter to assign the real cause for any pathological process, but in the great majority of cases probability amounts practically to certainty. Still there remain a large number in which the etiological factor is a matter of almost guess work. And this is somewhat the position of many cases of optic atrophy. Cerebro-spinal disease, inflammatory, degenerative, or neoplastic, accounts for the majority, though the precise mode of action is still uncertain. Anomalous cases remain for which no such explanation is possible, and in which the only discoverable associated pathological condition is some error of refraction, usually a low degree of H. combined with a varying amount of As. In the routine of ophthalmoscopic examination of hypermetropic eyes, one almost expects to find the discs of full tint, but though the colour of the normal disc varies within very wide limits, occasionally cases occur in which the appearances of congestion resemble those of early inflammation so closely, that one is chary of prescribing glasses. Attention has been called by many observers to this associated condition. Gowers, in Medical Ophthalmoscopy, says: "One other fact must be mentioned in connection with the diagnosis of the cause of optic neuritis. In many cases in which slight neuritis of chronic course is associated with symptoms which could scarcely suggest the existence of disease such as would cause neuritis, hypermetropia exists. This combination may be noted in chlorosis, in epilepsy, apparently idiopathic, and other slight symptoms of cerebral disturbance. It is doubtful in the present state of our knowledge, what there is to be attributed to the H. in the production of the neuritis, and from the commoness of H. the coincidence may have been accidental, but the fact deserves notice."

Hughlings Jackson, again, in his presidential address to the Ophthalmological Society in 1890, says, "he," that is the physician unacquainted with the significance of ophthalmoscopic signs, "may erroneously consider swelling of the discs due to H. as a neuritis signifying brain disease, and treat the patient on that hypothesis."

Dr. Stephen Mackenzie, in the fourth volume of that Society's transactions, relates a case of H. in a young patient, associated with great tortuosity of retinal vessels and congestion of the disc, and in the course of his remarks says: "Some of the patients have complained of headache, which predominated on the side where the greatest tortuosity of vessels and H. prevailed, but this has not been relieved by the correction of the H."

And many more observations of a similar nature might be quoted.

One cannot view without anxiety a condition of congestion of the papilla with moderate swelling and only partial veiling of the eye, persisting for many months. For it is quite conceivable that so lasting a condition of vascular turgescence should be followed by after consequences in the shape of direct compression of nerve fibres, or strangulation by slowly formed contractile tissue elements. It is difficult to understand the connection between such disc appearances and H., for in my experience it is the lowest degrees of refraction error that are accompanied by the most pronounced ophthalmoscopic signs. Another fact of interest in the cases is the co-existence of considerable ciliary spasm, so much so that the H. is often found to far exceed the total measured by retinoscopy. It is far more expeditious to proceed at once to the shadow test in young hypermetropic patients with full coloured discs. The smallness of the refraction error is sometimes so striking that one is almost forced to the conclusion that much of the ocular distress and headache that such people complain of, is attributable to the neurotic temperament. It would seem as though the vascular loss of equilibrium, the muscular excitability and spasm, and the subjective exaggeration of sensation, were part of a general neurasthenic condition excited by a low refraction error. Such an explanation tends to become a concession to the domain of functional diseases. Still the fact that the correction of the H. is often unattended by improvement in the objective appearances, relieving only the head and eye ache, is suggestive of a neurosis of the ciliary nervous system intensified by the hypermetropia. The intimate connection that exists between the ganglionic distribution of the ciliary nerves and the choroidal vessels, the high degree of development of the circular ciliary muscle in hypermetropes, and the frequency of ciliary spasm, points rather to the nervous instability of such a system. At the same time one would be led to expect more evidence of disturbance in the choroidal layer were this the only cause. The recognition of such a neuro-vascular bond as this, helps us to understand what we so constantly see in cases of chronic glaucoma—viz., the periodical exacerbation of symptoms produced by such indefinite agencies as mental worry and distress. I cannot but think that it is more important to direct our treatment at first against the threatening neuritis, dissociating it from the refraction trouble by prescribing iodide in combination with small doses of mercury and nerve sedatives, ordering such glasses as a careful retinoscopy may dictate, only when the neuro-retinal circulatory excitement has quieted down.

Dr. Jackson considered that accommodative strain was a cause of congestion of the eyes, but had never seen a case of optic nerve atrophy that he could attribute to hypermetropia alone. He thought that hereditary specific disease might possibly account for the first of Mr. Armstrong's cases.

Dr. Mackenzie was clear that conjunctival irritation was caused by H., and had seen cases in which swelling of the nerves was present in hypermetropic eyes, for which he could find no other cause than the H. These cases were generally in anæmic girls.

Dr. Kenny had never seen a case in which there was the remotest suggestion that optic nerve atrophy had been due to H. He could not accept the two cases given as convincing. A more detailed description of the state of the fundi, especially of the vessels, was required. Seeing the wide prevalence of H., he thought if the condition were a predisposing cause of atrophy this change would be far more common than is the case.

Dr. T. K. Hamilton thought that this paper was a very suggestive one, and although he has never been able to trace the connection in any way between optic atrophy and hypermetropia *per se*, the suggestion that such a connection is even possible—which connection he thought very problematical—may serve to make us more careful in examining in detail the condition of the fundus in all our refraction cases, even where no pathological changes are seen or even suspected.

COLOUR BLINDNESS AND IMPAIRED VISION IN SAILORS AND THOSE PERSONS EMPLOYED ON THE RAILWAYS.

By JAMES JACKSON, M.D., M.R.C.S., Melbourne.

Dr. Bickerton, in a late number of the *British Medical Journal*, has pointed out that the present rules of the road at sea, are rules only for men who have perfect colour and perfect far-sight; that 4 per cent. of the whole male population are colour blind, and 8 per cent. more have marked impairment of sight from errors of refraction; that there is no official record whatever as to a sailor's eyesight, which from disease of various kinds may be seriously impaired, and that there is no check on a man thus afflicted becoming a sailor, and remaining so till the end of his life. Further investigations by this gentleman show that calculating the number of sailors in the mercantile service at 120,122, and that of this number 3·824 are colour blind, we find that 4,593 persons, holding at the present time positions in which the correct interpretation of coloured lights is essential, are colour blind.

With these facts before us, I think no apology is needed for bringing this matter under the notice of the Congress.

The question of the proper examination of the eyesight of public servants and others has attracted great notice of late, since it has become apparent that the examination of candidates for entry is not uniform, and that re-examination is infrequent. The detailed method of examination varies very much according to the Company or branch of the public service in which the applicant is to be employed, and varies in different countries.

Curiously enough, there has been a good deal of passive opposition to the introduction of any measure of reform, principally in the public services. Some of the more enterprising steamship companies have been quick to recognise the importance of insuring perfect safety, as far as may be, their care dating from the now classic case of the Cunard vessel, Russia, in which Dr. Caldwell discovered (in 1877) a look-out man who had one glass eye. All scientific men and most common-sense people are agreed, but, oddly enough, the sole argument which seems to be used by those who take up a position of passive opposition, is that neither medical men in particular, nor men of science in general, seem able to point to many instances in which disasters have been positively traced to the employment of persons whose vision is defective. There are, however, three accidents on record due to defective vision, the sinking of the Isaac Bell, City of Antwerp, and Cashel Castle. The absurdity of the argument is evidenced by the fact that no examination of the eyesight of those navigating steamers or controlling railway trains, has ever been made after a collision, so that it is quite impossible to say whether defective vision had any influence whatever in bringing about the accident. For example, after the collision recently between the Elbe and the Craithie, Mr. Bickerton wrote to the Board of Trade suggesting that while the enquiry was pending it would be desirable to examine the eyesight and colour-sense of such of the Crathie's crew as were on deck at the time of the accident. Mr. Bryce, the President of the Board of Trade, replied that this question would be very carefully borne in mind during the enquiry, but nevertheless no examination of the eyesight was made, the committee being satisfied that colour-blindness had nothing to do with the cause of the collision. One cannot imagine a more ridiculous position with respect to a most important question. The attitude of the official mind appears to be somewhat as follows. It is tacitly assumed that some other causes than defective vision must have led to the accident. It is therefore assumed to be unnecessary to examine the sailors with respect to their colour-sense or form-sense. It has further been assumed that a mere examination of colour-vision is sufficient, and that the danger arises solely from defective colour-sense. Very much danger may arise from defective colour-sense, but even here the examination is notoriously defective, since it is not repeated, and applicants with perfectly normal sense may, as the result of tobacco smoking, for instance, possess very defective colour-sense later on in their career. But it cannot be too forcibly insisted that the ordinary form-sense must be carefully tested also, and that no examination can be regarded as satisfactory in which the refraction of the applicant's eye has not been tested. It is within the knowledge of the speaker that an engine driver in one of the colonies, some little time since, possessed vision of one-sixth in each eye, simply owing to hypermetropia with failure of correction owing to advancing age. Yet he had passed the initial test years before without the least difficulty, and many officials are probably in a similar position owing to defective regulations. The opposition to reform of the kind is very difficult indeed to understand, since it would be inexpensive and would simply mean the thorough examination of candidates on their entry into the service, and their periodic re-examination during their continuance in it. There need be no considerable expense and no considerable inconvenience, and the public would then feel that its interests were being properly and efficiently safeguarded.

Practically it is necessary that the vision of applicants for public appointments should be tested by medical men specially trained in ophthalmic work, otherwise loop-holes for escape must be left and the possibility of disaster continue. It is further most desirable that after any collision by sea or land the vision of all officials who were on duty at the time of the accident, should be carefully examined. Bickerton has several times quoted the historic case of the Vanguard, which may well be referred to again. Four men-of-war weighed anchor at Kingstown Harbour for Cork. They sailed into a fog, and whilst in the fog the Vanguard reduced its speed. The Iron Duke ran into and sank her. The slowing of the Vanguard was the direct consequence of a report by a look-out man that a ship was crossing the bows of the ironclad, and the Vanguard was slowed down to avoid running into this ship. The look-out man had defective vision, and in evidence said that his sight was not good on all occasions, that on two or three occasions he had been treated for defective eyesight, and that the sight of his left eye was a good deal stronger than that of his right. Of the five look-out men he alone saw the ship, which according to Mr. Hunt, First Lord of the Admiralty, seemed to be the veritable phantom ship. In a speech delivered on this disaster by Lord Brassey, it was stated that it turned out that this seaman had been twice treated for blindness in the right eye, which was the organ directed to the supposed ship. The Court of Enquiry nevertheless did not specifically refer to this important factor.

The Chairman then moved some resolutions, which were subsequently withdrawn in favour of fuller ones drafted by a committee of the Section, and which were finally adopted by the Congress.

Dr. Hogg, Invercargill, said that from time to time he was required to test boys who were entering the Government service, but that no specific tests were demanded, and that he very much felt the want of a definite standard for his guidance in the matter.

Dr. Cunninghame, Port Chalmers, said that he examined the officers and engineers in the Union Steam Ship Company (N.Z.). He also occasionally examined candidates for the Defence Department, Civil Services, and Lighthouse Service. The officers of the Union Steam Ship Company were examined on entering the service and upon permanent promotion; and it was proposed to examine masters at intervals of five years. Holmgren's wools were used for colour-vision, and the standard acuity of vision was that the candidate must be able to read, with each eye separately, three out of five letters or words on Snellen's test sheets at the distances marked on the chart. If an officer failed to come up to this standard he was deferred for a few months, and cautioned about smoking, &c. He considered that there was great hardship to the individual in being rejected, but recognised that the public safety demanded that this should be done in some cases. He had under observation an officer who had passed a few years ago under the Board of Trade regulations, who could not now see a letter on the card at six metres, his vision being only the top letter at 15 feet ($V = 4/60$). Before finally rejecting a man in such a position he would refer him to a specialist in eye diseases. He had no hesitation in saying that there were a number of employes in the different services at the present moment who had deficient eyesight, but the New Zealand Government had recently legislated to provide for the examination of the sight of ordinary seamen, and he thought that the result would be the weeding out of many of them.

Dr. Mackenzie to emphasize the necessity of thorough examination instanced his own case. He had $V = 6/5$, and his refraction was practically normal; but as a child he had difficulty in distinguishing green from grey, though by education he could now do so. He did a good deal of boat-sailing, and was unable to tell until he was close up whether he saw the red or green bearing lights, and found it impossible to tell whether a steamer's light was red or green till it was quite close up, though he was able to pass the test with the wools.

Dr. Kenny strongly urged the importance of a standard being fixed, and said that Dr. Mackenzie's remarks showed the importance of tests being made under the conditions in which weak colour-sense would make itself felt in practice as well as the ordinary tests with wools in the study.

Dr. Hamilton said that in South Australia the regulations made it necessary that the examinations should be carried out by a specialist, and thought that the example should be followed by the other colonies.

A committee was then apponted, consisting of Dr. Hamilton, Dr Kenny, and the Secretary, to draw up resolutions embodying the views of the Sub-section, and their report was adopted by the next meeting of the Sub-section, and later by the Congress in the following form :—

The Congress urges :

1. That the Governments of the different colonies should take steps to insure the proper testing of the vision of all men who are employed either at sea or in railway services, whose duties are such that the lives of others depend on the acuteness of their sight either for form or colour.
2. That all examinations of vision should be made by a properly qualified ophthalmic surgeon.
3. That a high standard of vision and perfect colour-sense should be insisted on for all men who are engaged as deck hands at sea, and who have to undertake duty on the look out or in steering. Also, that such a standard be fixed for those engaged in the engine room as will suffice for their own safety and that of the ship.
4. That a high standard be fixed for vision and perfect colour-sense required in all deck officers of ships. That they be re-examined on each promotion and after reaching the rank of master at intervals of five years.

5. That the attention of the different Governments be called to the report of Committee on colour vision presented to the Houses of Parliament in June, 1892, and to the Report of the Council of the British Medical Association on the efficient control of railway servants eyesight published in the same year, and that the standards recommended in these reports be taken as the basis on which the requirements of vision should be framed.

6. That the attention of the different Colonial Governments be especially directed to the law passed in the State of Alabama in 1887 dealing with railway servants' eyesight entitled "An Act for the Protection of the Travelling Public against Accidents caused by Colour Blindness and Defective Vision" as a model on which suitable legislation might be based.

In order to put in a definite form the standard that should be aimed at, the Congress suggests that no candidate be allowed to enter the dangerous services unless he is free from any chronic inflammation of the conjunctiva. He must be free from strabismus and possess perfect equilibrium of the external ocular muscles. His distant vision must be not less than 6/6 in one eye and 6/9 in the other without glasses, the tests to be made with Snellen's types. He must have perfect colour-sense, tested both with Holmgren's wools and distant colour tests under varying conditions, and he must also have a normal field of vision for both form and colour. Hypermetropia of more than one diopter should be a bar to entering the services.

THE TREATMENT OF CONCOMITANT CONVERGENT STRABISMUS.

By James W. Barrett.

Surgeon to the Victorian Eye and Ear Hospital.

In the Ophthalmic Reports for January, 1888, there appeared a paper by Mr. W. Lang and myself on the treatment of concomitant convergent strabismus. It embodied a careful analysis of some 350 cases of strabismus which had been treated by us at the Royal London Ophthalmic Hospital, Moorfields, and the general conclusions we came to were as follows:—

1. The spectacle treatment of convergent strabismus produces a rapid and complete cure in about 10 per cent. of cases.

2. In a large number, 33 per cent., the cure continues so long as the glasses are worn. In these cases it would probably become permanent in course of time.

3. We found, also, that 85 per cent. of cases were improved by treatment, only 15 per cent. failing to show some improvement by spectacle treatment.

The method then adopted was the prescription of spectacles by the method of retinoscopy under atropine, the insistence on the full correction and the continuation of the application of atropine until after the spectacles were obtained.

Notwithstanding this statistical evidence, statements have appeared from time to time in the text books (Fuchs, Swanzy, and others), which indicate the belief of the authors that the utility of spectacle treatment is somewhat limited.

I had been struck by the fact that latterly in the conduct of what I may regard as a large private practice and a very large hospital practice, I very rarely perform a tenotomy for strabismus, but nevertheless a paper by Mr. Kent Hughes, published in the *Australian Medical Journal* for September, 1894, aroused renewed interest in the subject. Mr. Hughes insisted on the importance of absolutely full correction and of making no allowance whatsoever for the atropine, and though he only quoted twenty-one cases, he showed a very high percentage of cures. The original work done by Mr. Lang and myself at Moorfields was of course entirely limited to hospital patients, and in the performance of hospital work it is sometimes difficult to be as precise or as systematic as in private practice, added to which the want of intelligence of the patients make the adoption of treatment a little more difficult. Accordingly with the assistance of Dr. Webster I instituted a re-inquiry into the subject, and during the past year have examined and treated eighty-five cases of strabismus. The order of procedure has been as follows :—

1. The accommodation and sphincter pupillæ have been completely paralysed by the prolonged instillation of atropine.

2. The refraction has been estimated by retinoscopy.

3. The after vision (where practicable) has been immediately ascertained.

4. The full correction (without any deduction whatsoever) has been ordered.

5. The atropine has been continued for from two weeks to several months, until the patient became quite accustomed to the use of glasses.

Where the patient was too young to permit of the satisfactory estimation of the after vision, an estimate was made, pains being taken to secure over, rather than under, correction. The patients were examined periodically, and the result ascertained.

It will be seen that with the exception of the especial care taken to secure full correction, the proceeding was exactly that adopted by Mr. Lang and myself at Moorfields.

Of the eighty-five cases treated thirty-one have been re-examined sufficiently to permit of the result being noted, and the details of these thirty-one cases will be found in the table accompanying this paper. The ages vary from four to twelve years.

No.	Sex.	Age in Years.	Duration in Months.	Eye.	Nature of Strabismus. P Periodic. F Fixed. A Alternating.	Angle at 4 Metres.	Angle at 35 Cm.	Time Glasses worn in Months.	Full Collection worn in Months.	Result with Glasses.	Result without Glasses.	Refraction.		Vision.	
												R.	H.	R.	H.
1	F	6	6	R	F	5°	10°	6	6	Parallel	5° & 10°	+ 3·5 sph. ⊂ + 1·5 cyl.	+ 4 sph. ⊂ + 1·5 cyl.	—	—
2	F	4	3·5	L	F	50°	50°	1	1	15°	50°	+ 1·5 sph. ⊂ + 1 cyl.	− 3·5 sph. ⊂ − 0·5 cyl.	—	—
3	F	7	12	R	F	25°	30°	3	3	Var. 10°-0°	—	+ 3 sph.	+ 3 sph.	—	—*
4	F	7·5	66	L	F	10°	—	25	1	0°	10°	+ 2·5 sph.	+ 3 sph.	—	—
5	M	6·5	3	L	F	15°	—	6	6	0°	0°	+ 4·5 sph.	+ 4·5 sph.	6/9	6/9
6	M	9	24	—	P A	5° variable	10°	5	5	0°	0°	+ 2·75 sph. ⊂ + 0·25 cyl.	+ 2·75 sph.	6/6	6/6
7	F	6	2	L	F	20°–40°	—	¾	¾	0°	40°	+ 5 sph.	+ 6 sph.	6/9	6/18
8	F	5	24	—	A	20° & more	—	8	—	0° & 15°	—	+ 5 sph.	+ 4 sph.	6/18	6/9
9	F	9	—	R	F	20°	—	24	—	0°	20°	+ 3 sph.	+ 3 sph.	6/12	6/9
10	M	12	—	R	F	50°	—	—	—	10°	20°	+ 2 sph. ⊂ + 1·5 cyl.	+ 2 sph.	6/36	6/6†
11	M	11	96	R	F	40°	—	84	½	10°	40°	+ 4·5 sph. ⊂ + 3 cyl.	+ 7 sph.	6/60	6/6
12	F	6	48	L	F	30°	—	24	3	10°	15°	+ 0.5 sph. ⊂ + 0·5 cyl.	+ 0·5 sph. ⊂ + 1·25 cyl.	5/6	6/6
13	F	6	24	L	F	5°	—	18	18	0°	0°	+ 1 sph.	+ 0·5 sph. ⊂ + 0·75 cyl.	—	—
14	M	4·5	30	L	F	35°	30°	14	14	Very little improvement.		+ 3·5 sph.	+ 3 sph. ⊂ + 3·5 cyl.	—	—
15	M	9	48	R	F	50° or more	—	18	18	5° & 10°	12° & 20°	+ 1 sph.	+ 1·5 sph.	—	—
16	F	9	36	—	F	over 30°	—	36	36	0°	—	+ 3 sph. ⊂ + 3·5 cyl.	+ 3·5 sph. ⊂ + 2·5 cyl.	5/6	5/6
17	M	7	36	L	F	15°	—	—	—	0°	15°	+ 6 sph. ⊂ + 1·5 cyl.	+ 8 sph.	5/9	5/60
18	F	6·75	57	R	F	15°	20°	—	—	0°	—	+ 7 sph.	+ 7 sph.	—	—
19	M	7·5	42	—	F	30°	35°	36	—	10°	30°	+ 6 sph. ⊂ + 0·5 cyl.	+ 7 sph.	5/5	5/12
20	F	11·5	120	—	F	28°	28°	48	6	5°	10°	+ 5·5 sph. ⊂ + 1 cyl.	+ 6 sph. ⊂ + 1 cyl.	5/12	6/9‡
21	F	6	36	R	F	30°	40°	½	½	0°	30°	+ 5 sph. ⊂ + 2 cyl.	+ 6 sph. ⊂ + 0·5 cyl.	—	—
22	M	8	60	L	F	15°	—	60	12	0°	0° temprarly	+ 7 sph. ⊂ + 0·5 cyl.	+ 7 sph. ⊂ + 0·5 cyl.	5/5	5/5
23	F	4	6	L	P	25°	40°	8	1	0°	25° & 40°	+ 4 sph.	+ 6·5 sph.	—	—
24	F	11	72	—	F A	10°	15°	1½	1½	5°	10°	+ 2·75 sph.	+ 4 sph.	—	—
25	F	—	—	L	F	20°	—	—	—	0°	—	+ 6 sph	+ 4·5 sph. ⊂ + 1 cyl.	—	—
26	F	10	—	R	—	5°	—	—	—	0°	—	+ 5·5 sph. ⊂ + 0·75 cyl.	+ 5·5 sph. ⊂ + 0·75 cyl.	5/9	5/9
27	M	7	36	L	F	12°	20°	12	12	5° & 12°	12° & 20°	+ 6 sph. ⊂ + 2 cyl.	+ 8 sph.	—	—
28	F	5	24	L	F	25°	30°	¼	¼	0°	0° temprarly	+ 3 sph.	+ 4 sph.	—	—
29	M	7	36	L	F	10°	20° or more	12	½	5°	5°	+ 3·5 sph. ⊂ + 1·5 cyl.	+ 4·5 sph. ⊂ + 0·5 cyl.	—	—
30	M	4	—	L	F	20°	30°	12	12	0°	5°	+ 2·5 sph.	+ 2·5 sph.	—	—
31	F	—	—	—	—	35°	40°	2	2	12° & 25°	30° & 40°	+ 3·8 sph. ⊂ + 0·25 cyl.	+ 3·5 sph. ⊂ + 0·5 cyl.	6/6	6/6

* Mother squinted in childhood.

† R.I.R.; divided fifteen months since.

‡ Nystagmus.

Following the plan formerly adopted, I have regarded as cured any case in which the convergence was five degrees or less. Owing to the limited period of time, one year, which has elapsed since the initiation of treatment, little can be said respecting the behaviour of the eyes when the glasses are removed.

Summarised, the results are as follows:—Of the thirty-one cases no less than twenty-four have been cured—that is to say, the squint has disappeared during the wearing of the glasses. Since, however, in cases one, six, thirteen, and twenty-six, the initial defect was only about five degrees in the primary position, these may reasonably be excluded. We then have twenty cures out of twenty-seven cases, a percentage of about seventy-four. Of the remaining seven cases in six there was considerable improvement, as follows:—

In case	2	from	50	to	15	degrees
,,	10	,,	50	,,	10	,,
,,	11	,,	40	,,	10	,,
,,	12	,,	30	,,	10	,,
,,	19	,,	30	,,	10	,,
,,	31	,,	35	,,	12	,,

In one case (fourteen) alone there was no improvement whatsoever.

Here, then, lies the explanation of the infrequency of tenotomy in practice in later years. There is just this difference between the treatment adopted by me nowadays and that adopted by Mr. Lang and myself at Moorfields, that the use of spectacles is supplemented by the adoption of ocular gymnastics upon a much more thorough and extensive scale. The bandaging of the sound eye for several hours daily, systematic exercises of the external rectus, and (in some cases) the use of Landolt's stereoscope, have formed part of the daily routine. But in the course of treatment the value of full correction became very obvious. Several cases in which there had been improvement, but not complete cure, were found to be uncorrected by one diopter or thereabouts. In some of these the complete and full correction caused rapid improvement and cure.

Starting the inquiry with the belief that the benefit of this final correction had been exaggerated, I conclude holding the opinion that it has, if anything, been under estimated.

Dr. Jackson said that he had always been in doubt as to the advisability of giving much correction beyond the manifest hypermetropia, but the results obtained by Dr. Barrett would lead him to try the effect of full correction. He was in the habit of using atropine for three days before estimating the refraction of young people.

Dr. Purchas always used cocaine to dilate the pupil for examination of the eye, and found that its mydriatic effects were much more marked when it was used in a dark room. For estimating refraction he used atropine for three days in children, but found in patients over the age of 30 that homatropine was sufficient.

Dr. Kenny always used atropine when possible, feeling more certain in its results than homatropine. After one installation of an ointment of gr. 4

of the alkaloid to the ounce, he gave a gr. 4 solution of the sulphate for use for three days. After measurement by retinoscopy, which he usually did with the concave mirror, he tested the vision with and without glasses, and the patient returned after the effect of the atropine had passed off, before the glasses were given. Homatropine he only used in cases where immediate measurement was necessary, and applied in castor oil, then bandaging the eye for twenty minutes and measuring immediately. He seldom gave the full correction, but demanded constant use of the glasses, and covered the good eye daily. He insisted on a large template for the glasses of children, and checked not only the correctness of the lenses but also the fit of the frames. He was satisfied with his results, and had operated on only two cases of squint during the last seven years.

Dr. Mackenzie used five or six installations of homatropine half-hourly, but considered atropine more useful in children. He gave the full correction of the hypermetropia.

Dr. T. K. Hamilton's routine practice in children and young adults, was to use atropine wherever practicable. He estimated the error by retinoscopy, and in all cases of strabismus corrected the full amount of the error thus estimated. He thought his results corresponded pretty fairly with those of Dr. Barrett. He referred to the group of cases in which there was upward deviation of the squinting eye, and considered glasses did not cure them. In one such case he had to adjust the position of all four recti by operation. He endorsed what Dr. Kenny said about large templates for the glasses of children, and said they could with advantage be made periscopic.

THE PRESENCE OF FINE OPACITIES IN THE VITREOUS.

By James W. Barrett,

Surgeon to the Victorian Eye and Ear Hospital; and

P. S. Webster,

Assistant Surgeon to the Victorian Eye and Ear Hospital.

We have been much impressed with the comparative frequency with which fine opacities of the vitreous are visible in the eyes of elderly people. Eyes which show no other sign of degeneration, and in which the vision is normal, show them. The opacities cannot as a rule be detected with the retinoscopy mirror or by oblique illumination, but they can be detected by the use of a + 12 or + 20 lens, when examining by the direct method. It became a matter of interest then to ascertain how far this appearance must be regarded as pathological, and how far as evidence simply of senile degeneration.

No.	Sex.	Age.	Disease.	Vision.		Refraction.		Opacities.	
				R	L	R	L	R	L
1	M	58	Tobacco amblyopia	6/60	1/36	+ 0·5 sph.	+ 0·5 sph. ⊂ + 0·75 cyl.	None	None
2	F	74	Refraction	5/5	5/5	+ 1·25 sph.	+ 1 sph.	None	None
3	M	64	Cataract incipient	5/9	5/36	+ 0·5 sph. ⊂ + 1·5 cyl.	+ 0·5 sph. ⊂ − 1 cyl.	None	None
4	M	53	Tobacco amblyopia	5/9	5/6	+ 0·75 sph.	+ 1 sph.	None	None
5	F	67	Chroniciritis--vitreousdegen.	5/36	5/36	—	—	Full of opacities	
6	M	38	Lens degenerating	5/18	5/12	+ 1·5 sph. ⊂ + 0·5 cyl.	+ 1·5 sph. ⊂ + 1 cyl.	Opacities anterior part of vitreous	
7	M	45	Pterygium	5/9	5/6	+ 2 sph. ⊂ + 0·75 cyl.	+ 2 sph.	Fine opacities	
8	F	50	Refraction	5/9	5/9	+ 2 sph. ⊂ + 2·5 cyl.	+ 2·5 sph. ⊂ + 3 cyl.	None	None
9	M	38	Indefinite—fields contracted fundus normal	5/9	5/9	+ 0·5 sph.	+ 0·25 sph.	Membranous opacities	Fine opacities
10	M	67	Glaucoma simplex	5/24	5/12	—	+ 0·5 sph. ⊂ + 1 cyl.	Opacities	Opacities
11	M	45	Refraction	5/5	5/5	+ 0·5 sph. ⊂ + 0·5 cyl.	+ 0·25 sph.	None	None
12	F	50	Refraction	5/5	5/5	+ 0·75 sph. ⊂ + 0·75 cyl.	+ 0·75 sph.	None	None
13	F	60	Refraction	5/6	5/9	+ 0·5 cyl.	+ 1·5 sph. ⊂ + 0·75 cyl.	None	None
14	M	48	Refraction	5/5	5/5	+ 1 sph. ⊂ + 0·75 cyl.	+ 1·5 sph.	None	None
15	M	51	Traumatic hyphæmia (R)	5/9	5/18	− 2 sph. ⊂ − 0·5 cyl.	− 12 sph. ⊂ − 2 cyl.	Opacities	Opacities
16	M	44	Detachment retina (R)	—	—	− 8 sph.	− 1·5 sph.	Opacities	Fine opacities
17	M	53	Refraction	5/5	5/5	+ 8 sph.	+ 1·5 sph.	Very fine opacities	
18	M	56	Refraction	5/6	5/9	+ 1 sph. ⊂ + 1·75 cyl.	+ 3·5 sph. ⊂ − 4·5 cyl.	None	None
19	M	66	Retinal hæmorrhage (L)	5/5	2/60	+ 0·5 sph. ⊂ + 1 cyl.	+ 0·5 sph. ⊂ + 1 cyl.	None	Opacities
20	M	47	Enucleation (R)	—	5/5	—	+ 0·5 sph.	—	None
21	F	62	Cataract (R)	5/24	5/9	− 1 sph.	+ 2 sph.	—	Fine opacities
22	M	56	Refraction	6/6	6/6	+ 0·75 sph.	+ 1 sph.	None	None
23	M	58	Paralysis third nerve	6/6	5/12	+ 2 sph.	+ 2 sph.	None	None
24	M	60	Refraction	5/9	5/6	+ 2 sph. ⊂ + 0·5 cyl.	+ 2 sph.	Opacities	Opacities

We accordingly instituted an enquiry, and examined 46 eyes of 24 people. With one exception (Case 9, 38 years of age), the cases were over 45 years of age. The details of the examination are appended to this paper. The results may be summarised as follows. In 46 eyes of 24 people indiscriminately selected in private and hospital practice, opacities were detected in 11 cases, or in 20 eyes, the 21st eye being free from opacities, and the 22nd being cataractous. Of these 20 eyes there was visible disease in seven—namely, iritis in two, glaucoma in two, traumatic hyphema in one, detached retina one, and retinal hæmorrhage one. Thus in 13 out of the 46 eyes (28 per cent.) there were definite opacities in the vitreous without any other evidence whatsoever of ocular disease. On the other hand, it is not uncommon to meet with men of advanced age whose vitreous is perfectly clear, but these figures bear out the conviction slowly forming as the result of experience, that fine opacities are not at all uncommon during the period of physical degeneration. They may have a pathological significance. In one case of detached retina which came under our observation, the vitreous of the other eye was filled with fine opacities, although there was no detachment whatsoever. Can this be regarded as that antecedent fine change in the vitreous which indicates some form of ocular degeneration and predisposes to detachment?

Without, however, theorising at length, we desire simply to emphasise the fact that these opacities are commonly present, and to leave the question open whether they are to be regarded as a physiological degeneration—if one can use such a term—that is, as a natural attendant of senility, or whether they are to be regarded as distinctly pathological in their significance.

RHINITIS CHRONICA ATROPHICANS FŒTIDA.

By T. K. Hamilton, M.D. (Univ. Dub.), F.R.C.S.I.,

Hon. Physician to the Throat Department, Adelaide Hospital.

This form of rhinitis has been known and well recognised from very early times, but it is only of late years, since the study of intra-nasal diseases has been conducted in a somewhat rational and scientific manner, that anything like a thorough investigation of the disease has been attempted. During this later period there is no disease probably whose ætiology, pathology and treatment has been more exhaustively discussed amongst rhinologists than that now under consideration. But even though the subject is thus, so to speak, threadbare, I am venturing to lay before this Section a record of 170 cases, which form about 4 per cent. of the cases of nose disease which I have examined.

I am encouraged to undertake this task in the hope that it may not be altogether uninteresting or unprofitable to compare my statistics with those of the older countries; the climatic influences and the social surroundings in

South Australia are so very different from those of colder and damper countries, and countries where the hygienic conditions of large centres of population are far from conducive to health, that we might expect a comparison not altogether devoid of practical interest could readily be instituted between them. To make this comparison shall be my object, and in order to accomplish the same, I have endeavoured to work out my statistics as carefully as possible.

You will notice that I have headed my paper with the technically correct name of the disease, but I shall for brevity's sake use the more familiar, but less correct expression, "Ozæna."

This name, which has been so long used to describe the disease, has, like all names given to a disease which only represents one symptom thereof, been a cause of great confusion, and has rendered the statistics of the older writers almost valueless.

The term "Ozæna" has been, up to lately, used to include every disease of the nose in which there is fœtid discharge, and it was not till Fränkel (Berlin) insisted on the view that "Ozæna," if retained at all, should be confined to dry catarrh, in which there is no ulceration or diseased bone, and in which the decomposition of the retained secretions gives rise to an offensive smell, that the term has been properly and accurately defined.

The cases I am recording belong strictly to this latter category.

In dealing with such a disease it is somewhat difficult to treat of the ætiology and pathology separately, as they are sometimes so intermixed, but I shall endeavour to separate them as far as possible.

Ætiology.—Ozæna is seldom found in subjects under 4 years old, towards puberty it increases in severity, and the majority of cases commence before 11 years. I find the average age of onset in males is 19, and in females 14 years, but most probably these ages, though carefully recorded, are only approximately correct, as it is so difficult to find out from patients when the disease really commenced, in many cases probably much earlier than they say or think.

Females are much more liable to the disease than males, so much so that Voltolini says, "In my experience the disease is a woman's disease." The proportion in my cases is 123 to 67, or about two females to one male. De Havilland Hall has found as many as seven females to two males. In this connection Wright writes: "Ozæna being most frequent in females and most frequently developing at the age of puberty, while it is rarely seen after the menopause, it is fair to conjecture that there is some unexplained influence exercised on the course of the disease, at least as far as the ozæna goes, by the genital apparatus."* And again, Lennox Brown traces this same connection, but asserts that the menstrual functions are also in some cases influenced by pre-existing ozæna. He writes:—

"In many cases the disease first becomes objectively evident to non-medical observers about the age of puberty, because the resulting ozæna is more marked at the menstrual periods. But not only is atrophic rhinitis to be found in individuals who, having arrived at puberty, are amenorrhœic, and in later years perhaps menorrhagic, but I have seen so many cases of the disease commencing in young children at the age of 7 or 8, in whom the menstrual epoch has afterwards been abnormally delayed, that I cannot doubt the causal connection between wasting or non-development of the erectile tissues of the nasal fossa, and a similar condition of the female generative organs. I have also satisfied myself that there is much truth in J. N. Mackenzie's view as to the association of other kinds of sexual sympathy and irritation as factors of nasal disease generally, and of the atrophic form in particular."*

---

* "N. Y. Med. Record," August 9, 1891.

Having carefully collected statistics on this point I find that 14½ years is the average period of onset of the menstrual periods amongst my patients in South Australia. Two at the age of 13½ years had not up to then menstruated, and one was amenorrhœic at the age of 18. These figures would seem to lend something of proof to the statement made by Lennox Brown on the age question, as in warm climates, like that of South Australia, menstruation usually commences before 14½ years. I also find that menstrual irregularity existed in some eight or nine cases at various ages.

De Havilland Hall says: "In the ætiology of genuine ozæna, anomalous states of the blood and dyscrasic conditions hold the first, if not the only place. Ozæna often develops after measles, diphtheria, or after typhoid or severe parturition—*i.e.*, those diseases which are associated with anomalous conditions of the blood and of nutrition." In six of my cases the disease seemed to have appeared after measles, in two after scarlatina, in two after typhoid, in two after erysipelas, and in four influenza is credited with causing or increasing the nasal trouble. Again, injury seems to start the mischief in some cases. In seven of mine this is assigned as the cause.

Heredity does unquestionably play a part in predisposing to ozæna; this is shown by the disease appearing in the children of ozænic parents, and by several members of the same family being affected. There is no evidence, at the same time, that the disease is in any way contagious, quite otherwise. In 10 of my cases has this inherited tendency shown itself.

The next question that arises—and this is one of the most interesting points in the ætiology of the disease—is this: Does ozæna occur in those who are healthy, or is it only found in the unhealthy? Here there seems to be some conflict of opinion amongst the authorities. Bosworth says that ozæna occurs as a rule in persons enjoying perfect health. On the other hand, Michel states emphatically that no one who is quite healthy gets ozæna.

My experience goes to prove that the truth lies probably between these two extremes. I feel certain some individuals who are attacked by ozæna are at the time perfectly healthy, but often become unhealthy as a result of the local disease.

Greville Macdonald expresses this opinion as follows:—

---

* "Diseases of Nose and Throat," p. 582.

"Occasionally at the commencement of the disease the patient is robust in every respect, though in all cases of some years duration there is considerable anæmia; from which it would appear that the local disease is mainly responsible for the constitutional disability, an observation entirely supported by the results of local treatment in restoring the general health."*

Probably this anæmia which exists as the result has been described as a predisposing cause in some of these cases, hence the difference of opinion. That a certain proportion of the cases manifest both a family and an individual delicacy is abundantly shown by my statistics. Of the families whose health is recorded one-third are only fairly healthy, and of the individuals themselves the unhealthy exceed the healthy numerically by five. In six cases marked anæmia was present.

Struma, tuberculosis, and inherited syphilis have all been put down as predisposing causes of ozæna, and here statistics should be helpful, as there is a conflict of opinion on this point, too, amongst writers.

Schäffer considers the complaint is always due to struma or syphilis, Störk thinks that ozæna is always syphilitic; and Schrötter also puts syphilis down as a frequent cause. Both Störk and Schrötter, however, are here probably using the term ozæna in its older and wider sense, which includes syphilitic ozæna. Morell Mackenzie does not consider the disease constitutional in the true sense of the word, nor does he think scrofula a cause. He has met with only three cases in which any evidence of hereditary syphilis existed. Bosworth says:—

"Ozæna bears no possible relation to syphilis in any of its stages or manifestations. The same broad statement may be made in regard to tuberculosis and scrofula."†

To come to South Australia. First, as regards struma. I scarcely think this can be a large factor in the causation of the disease amongst us, as it is well known how seldom strumuous developments are seen in our climate. As to tuberculosis I find a family history of phthisis in only six of my cases, and on looking over the records of about 100 cases of tubercular disease of the nose and throat, I do not find amongst them one single case of ozæna.

Lastly, as regards syphilis. In only two cases was there any evidence of hereditary syphilitic taint. These, it is true, were singularly severe cases. But here, again, on turning up the notes of about 40 cases of inherited syphilis, from my eye and ear note-books I fail to find ozæna present in any of them, except in the two just referred to.

The social position and surroundings of my patients is of considerable ætiological interest when we compare their conditions with those of the large centres in the older countries where extreme poverty exists. I am not in a position to say if 4 per cent. of all cases examined in hospital and private practice is a large proportion or not, nor do I know how these statistics compare with those drawn from a mixed practice, say in London; but if there be not much difference in the proportion of cases, it is obvious that the environment does not play a prominent part in its causation, and an analysis of my cases goes a good way towards proving that healthy surroundings do not prevent the disease making its appearance. Of my cases 128 were born in the colonies, and 55 were born in the country. None of them were so very poor as to suffer from want or privation of any kind, and a large proportion of them, probably 85 per cent., were living in comparative luxury as far as good food, air, and clothing are concerned. Under these circumstances ozæna cannot be said to be in these colonies at least a "poor man's disease," or one which poverty necessarily predisposes to.

---

* "Diseases of Nose," second edition, p. 144.

† "Diseases of the Nose and Throat," p. 168.

Pathology.—One of the first questions which meets us in dealing with the pathology of ozæna is this, Is rhinitis ever *ab initio* atrophic? This has been, and still is, a very vexed question.

The German school, headed by Fränkel,—who originated the idea—maintain that atrophy is a further stage of hypertrophy. "Morell Mackenzie," says Lennox Brown, "probably represents a large consensus of opinion when he says atrophy appears to be always a secondary affection."* But on the opposite side we find a strong minority of such close observers as—*e.g.*, Greville Macdonald, who says that an ordinary catharrhal hypertrophic rhinitis never leads to an atrophic, except where we have caries;† or Bosworth, who expresses his opinion that this theory is not proved; or Lennox Brown, who thinks that atrophy is often primary; or Watson Williams, who speaks more strongly still, and says, "In the great majority of cases the disease is primarily atrophic."

I have hitherto failed to find any case in my own practice in which I could be at all sure that hypertrophy preceded the atrophic changes, and I am therefore disposed to question the accuracy of the observation of those who state that such is the case. But observation and enquiry into the previous history of cases of ozæna have convinced me of the correctness of Bosworth's statement, that purulent rhinitis in childhood is very often the precursor of ozæna later on. In 35 of my cases has this relation of the two conditions existed.

Ozæna is almost invariably associated with atrophy, or what is looked upon as such. A few cases occur in which there is little or no wasting, I found it so in nine of mine, and in a very limited number there seems to be even slight hypertrophy. I had two such cases in which there was distinct hypertrophic enlargement of the septum and tubercle, with tumification of the inferior turbinated, and this co-existed with marked caking of discharge and fœtor.

The disease is almost always bilateral; in five instances was it unilateral amongst mine.

I have said just now that ozæna is usually associated with atrophy, or what is looked upon as atrophy, for as Greville Macdonald has pointed out, the condition is sometimes in the earlier stages not real atrophy, but only a collapse of its erectile tissues, which, after a time of treatment, with removal of the surface pressure caused by the inspissated discharge, &c., resumes its original size. It is the restoration to the normal state of cases like this that has given rise—but wrongly so—to the idea given expression to by Noquet, that an atrophic mucous membrane may even be sometimes regenerated. In this connection may be mentioned the remarkable shrinkage of lymphoid structures which co-exists with ozæna, as drawn attention to recently by Wyatt Wingrave. He says :—

---

* "Diseases of the Nose," p. 581.

† "Diseases of Nose," Ed. II, p. 158.

"The most striking uniform incidental change observed was the disappearance of lymphoid structures. In 56 out of 60 cases the faucial and pharyngeal tonsils had entirely disappeared, while in the remaining four they were very small ; the lingual tonsils were equally diminutive, for in all well-marked cases the pharyngo-glossus was entirely smooth. This shrinkage and disappearance of lymphoid structures is, I venture to submit, a significant feature of the disease, and has something more than a mere coincidental relation to the intra-nasal changes."*

I find in 24 of my cases, out of 55, there was atrophy of the pharyngeal tonsil, and in five of these post-nasal synechiæ existed, in 20 cases there was atrophy of the faucial tonsils, and in 12 atrophy of the post-lingual lymphoid tissue.

The theories propounded by Zaufal, Berliner and Michel, as to the cause of ozæna, only require to be mentioned to be rejected.

Berliner's (which is the opposite to Zaufal's) is that ozæna is due to pressure of the middle turbinateds against the septum, with consequent defective secretion. I have recorded the condition of 46 of my cases in this respect, and find in only 18 did the middle turbinated touch the septum ; this is quite a small proportion considering that enlargement of the middle turbinated is the usual condition—at any rate in cases of any standing—due as it is to inflammatory swelling from the irritation of the retained discharges. In four cases there was polypoid enlargement of this body, and in one a very interesting condition—viz., an abscess (encysted) of the middle turbinated, there were no adhesions between the cyst wall and the outer wall of the meatus. This is the first and only case of abscess of the middle turbinated I have seen in ozæna.

As regards Michel's theory that ozæna originates in a chronic purulent inflammation of the sinuses, especially the ethmoidal and sphenoidal, J. N. Mackenzie says : "This theory is at variance not only with the clinical, but also with the anatomical, facts of the case, as demonstrated by *post mortem* examinations ; there is abundant clinical and anatomical evidence that the sinuses are, as a rule, only secondarily affected."†

Greville Macdonald, Bosworth, Morell Mackenzie, and others endorse this opinion. My cases furnish the following :—Two of suppuration of the anterior ethmoidal cells, and in one probably the sphenoidal sinus as well, six of empyema of the maxillary sinus, in one case bilateral, and in another coming on as an acute inflammation after influenza.

---

* "Journal of Laryngol.," vol. 6, p. 100.

† Burnett's "Diseases of the Nose," p. 662.

Lastly, space will not allow me to do more than mention the theory of the condition which does seem to predispose in all cases to the disease, and that is, an abnormal patency of the anterior nares.

This, according to Greville Macdonald, is a constant feature, and, as such, it is credited by him with being the predisposing local cause. That this theory is equally applicable to later stages of the disease, and that the more the patency of the nostril the more pronounced the local condition becomes, a review of my cases will prove. I find in 19 cases one nostril more atrophied than the other, and in 17 of these the discharge was more copious, and the eye and ear complications more pronounced than on the other side. In several of these cases the atrophy was very advanced, in one particularly the middle and inferior turbinateds had entirely disappeared, there appeared to be shrinking even of the muscular structures, the soft palate was so attenuated that the patient was unable to shut off the post-nasal from the buccal cavity, and there existed a corresponding atrophy too, probably of the superior constrictor.

Symptoms.—Some authorities mention the fact that ulceration, and even perforation of the septum, is apt to occur from the picking of the nose, which the patient resorts to to relieve irritation coincident with the retained discharge. Just the opposite to this has been my experience, I find that picking of the nose is not resorted to, or scarcely at all; the sensibility of the mucous membrane is so diminished that the pressure of the crusts is usually not a source of discomfort, and ulceration, much less perforation, have not been found in any of my cases, except indeed in three, but in two of these the perforation followed the performance of Rouge's operation (an occurrence not by any means uncommon after this procedure) performed some years previously.

Hoarseness and aphonia are often present, due no doubt to the chronic laryngeal catarrh induced by breathing of air unprepared through nostrils incapable of performing their proper functions.

Where laryngo-tracheal ozæna also exists (as we shall see presently) that will also be a cause of these symptoms.

Out of 36 cases I found chronic laryngeal catarrh in 17.

Impairment of the sense of smell is the rule in ozæna, out of 56 cases there was complete anosmia in 24, defective sense in 20, and in 12 there was no impairment of the function.

In 10 cases distinct improvement in the sense of smell followed systematic treatment.

In five cases the nose presented a flat, broad appearance, with a depression at the point of articulation with the frontal bones; these were cases of advanced atrophy.

The fœtor is said to become less intense, and may entirely disappear in old age, Morell Mackenzie says it generally ceases after 50 years; out of 10 of my cases which were over this age, and three of them over 60 years, in only two had the fœtor disappeared, indeed in the remaining eight the stench was still very great. In one of these cases, an old lady aged 56, there was a double source of the fœtor, the nose and the trachea. She had tracheal ozæna as well.

B. Fränkel was the first author who mentioned fœtid crusts in the larynx and trachea.*

Luc† found in these conditions a diplococcus, similar to the one detected by Löwenburg, in the nose, and considered by him to be the cause of the special fermentation that gives rise to the characteristic smell of ozæna. He also found that the crusts were primarily developed in the trachea, and did not descend from the nasal cavities. He states likewise that tracheal ozæna is not so rare a clinical occurrence as it is said to be. Its supposed rarity arises from the fact that hitherto specialists have left this affection unobserved, because they have omitted to inspect the tracheas of their patients. Out of 36 cases examined I have found five of this condition in all, two in which the exudation was in the larynx, two in the trachea, and one in both.

The Eye and Ear diseases found associated with ozæna form an interesting group, and demand a passing reference.

Of the Eye Diseases we find catarrhal conjuctivitis, blepharitis, phlyctenular, and other ulceration of the cornea; epiphora and blenorrhœa of the lachrymal sac, and such reflex symptoms as blepharo-spasm, photophobia, &c.

In the proceedings of the Second Intercolonial Congress I have recorded a number of cases of ocular disease, which had a nasal origin, and I endeavoured then to explain how that these reflex processes depend upon the anatomical fact that both cavities are supplied by twigs of the first and second trigeminal branches of the naso-ciliary and spheno-palatine nerves, and also the connection through the associated action of the ciliary and rhinic ganglia.‡

In 37 of my cases there was some eye condition present. In 28 accommodative asthenopia; in two blepharo-spasm; and in three cases was there found some concentric contraction of the visual field. Trousseau says: "There exists a true nasal asthenopia which only yields to treatment of the pituitary membrane."§ In some of my cases I have found this literally true—*e.g.*, in one case, an obstinate phlyctenular conjunctivitis, accompanied by blepharo-spasm and photophobia, it was absolutely uninfluenced by some weeks' treatment of the ocular trouble, and it was not until the ozæna, at first unsought for, but afterwards recognised, was treated, that the eye symptoms promptly disappeared. I confess to being astonished at the result myself, and from my experience of this and other similar cases I am convinced that such results can be not infrequently obtained, if only the relation of the two conditions be recognised. Lastly, the relation between diseases of the lachrymal apparatus and diseases of the nose is of some practical importance. Bronner says: "In about one-third of the cases of epiphora, there is no stricture of the duct, and we can find no cause for the epiphora, except a swelling of the mucous membrane of the nasal duct, and I have cured many such cases of long-standing trouble simply by treating the mucous membrane of the nose."* My cases furnish four instances of blenorrhœa of the lachrymal sac, and several cases of epiphora.

---

* *Ziemssen's Handbuch die Krankheiten die Nase*, p. 150. "Journal of Laryngol.," vol. 3, p. 1.

† "Journal of Laryngol," vol 3, p. 1.

‡ Vide Proceedings Second Intercolonial Congress, p 779.

§ *Soc. d'Ophthalmologie*, Ap. 1889.

But reference to my eye note-books, and an analysis of some 120 cases of epiphora, blenorrhœa, or dacryocystitis, show that atrophic rhinitis is not the condition which is most frequently associated with lachrymal disease, in 35 per cent. of the cases there was hypertrophic rhinitis, and only in 14 per cent. was there atrophic, whilst in 50 per cent. the nasal cavities were normal.

Ear Diseases.—A moderate impairment of hearing probably occurs in the later stages of ozæna in many cases. Beverley Robinson says that aural complications are met with in atrophic rhinitis far more frequently than in hypertrophic, and Morf has found disease of the middle or internal ear in 55 per cent. of his cases of ozæna.†

Bosworth, on the other hand, says: "I have always regarded hypertrophic rhinitis as a very active cause of middle ear troubles, certainly in a given number of cases of grave impairment of hearing the number due to the hypertrophic disease outnumbers those due to the atrophic in far greater proportion than the comparative frequency of the two affections."‡

I am disposed to agree with Bosworth, though it is very difficult indeed to work out statistics on such a question. But the general impresssion in my mind is that a stenosed condition of nostril is even more injurious to the ear than an atrophic.

Amongst my cases I find five of Eustachian catarrh, 14 of chronic middle car catarrah (12 of which were bilateral), and nine cases of chronic suppuration of the middle ear (three of which were bilateral).

The bacteriology of ozæna may be passed over, as, although there has been a great deal of research made in this way to discover, if possible, the bacterial origin for the disease, it must still be admitted that nothing positive is known of ozæna from this point of view.

The diagnosis may also be passed, as nowadays, with our strictly accurate definition of the term ozæna, and careful examination, an incorrect diagnosis could scarcely be made by any competent observer.

Prognosis.—The prognosis of ozæna, at one time so dreary a subject, inasmuch as the disease was considered absolutely incurable, has now of late years assumed a more cheerful aspect, owing to the disease being better understood, and owing to the many improved methods of treatment adopted. To answer the question, Is ozæna curable? one must define what the word "cure" means.

---

* "Journal of Laryngol," vol 3, p. 283. † "Arch. of Otol," No. 4, 1894.
‡ "Diseases of the Nose," p. 171.

If by a cure we mean that in cases where degenerative changes of the intra-nasal structures have taken place, a complete *restitutio ad integrum* can be brought about, then we must admit that the disease is incurable. But if, on the other hand, we mean that in cases where no real atrophy has taken place, we can restore the collapsed tissues to a normal condition, and at the same time remove the accompanying distressing subjective and objective symptoms, or again, in cases where actual atrophy has occurred, we can, by treatment, rob the disease of its worst feature, and change the patient's life into one of comparative comfort to themselves and their friends, then I say we can expect, and do obtain a positive, or at worst a relative, cure. It has been left to the writers of very recent date to sound a more hopeful note in this hitherto sad and doleful prognostic history of ozæna. Greville Macdonald says: "The prognosis of ozæna is comparatively good, and so far as treatment is efficiently conducted, is in every way satisfactory. To this belief I adhere in spite of the assertion of some eminent authorities as to the incurability of the disease."* And he it was who first, by drawing attention to the importance of recognising the distinction between true atrophy and only a temporary collapse of the erectile tissues, pointed out how in this class of cases brilliant results can be obtained by well-conducted and persistent treatment. So altogether we can now approach even the most advanced case of ozæna with the confident hope, that, if the patient will only co-operate with the physician, much can always be done to establish even in the worst case a comparative cure of his malady.

Treatment.—On this part of the subject I shall be as brief as possible. Although the remedies recommended for the cure of ozæna are innumerable, the secret of successful treatment lies more in having a clear conception of status præsens of the disease in each case, an intelligent adaptation of suitable remedies thereto, and also, above all things, a persistent determination on the part of both physician and patient to continue the treatment for any period of time, however lengthy, which may be found necessary.

Too much stress cannot be laid on the earliest possible treatment in childhood. Cases of purulent rhinitis in young children, especially if a family tendency to ozæna exists, should always receive careful attention. The improvement of the general health, when in fault, should be aimed at on general principles, menstrual irregularities in females must be corrected, and an outdoor life, as far as possible, should be encouraged. I have seen cases which promised well rapidly go back when the patient took to an indoor life, closed up, for example, in a city office.

But as the local disease is mainly responsible for the constitutional disability, we must, contrary to our clinical custom, place it first in order of importance. The local treatment resolves itself into the removal of the discharges, the promotion of secretion to prevent their re-accumulation, augmentation of the blood supply of the mucous membrane, and lastly, in the rare cases of sinus disease, the proper evacuation and treatment of their interior.

First, to remove the discharge, I always make sure that the nostrils are thoroughly cleared out at the start, and to do this I usually use the pneumatic spray, with from 15 to 20 pounds pressure. For after-treatment, in the way of irrigation, I am indebted to my friend Dr. Greville Macdonald for telling me some eight months ago of a method of washing out the nose, which he has found better than any other kind of douche. I shall quote his own description. In writing of a very advanced case, a patient of my own, whom I had asked to consult him in London, he writes: "The case is indeed a very distressing one, one which taxes all our energies and more than all our remedies, but in a few of these apparently hopeless cases I have had considerable success by irrigating the patient's nasal fossæ while he is lying on his back, with the head hanging over the end of the couch. In this way the fossæ are upside down, so to speak, and it is possible to hold in the nose a very large quantity of fluid, which finds its way into the accessory cavities, I think, in a very remarkable way. I have seen two of such cases, I believe, completely cured by this process, but it has to be adopted with considerable care, for at first the patient experiences very distressing headaches afterwards if he holds his head in this position too long at a time, and I am always careful to instruct him not to retain the fluid for longer than one or two minutes at first, gradually increasing the time until he can hold it there for as long as twenty minutes two or three times a day. I never use any irritating lotion for this process, and have found, I think, a 5 per cent. solution of boroglyceride solution the most useful. I also pack the nostrils between the washings with alembroth or boric wool." Dr. Macdonald has since recorded some of his results by this method of irrigation. This is the only detailed account I can find of the treatment. J. N. Mackenzie* and Cartaz† are the only two authorities who make any allusion to irrigation by inversion at all. I have adopted the method in some 30 cases, and find it by far the best mode of cleansing the nostrils which I have ever used. Most patients are quite enthusiastic over the results, owing to the relief to pain and fulness in the nose and head, and the feeling of freedom it gives at once to the breathing. These and other symptoms are sometimes very marked, and the more the wasting of the cavities the more relief is usually experienced. Irrigation by this method does seem to provide the desideratum for nasal douching. The method is simple, effective, and free from any injurious consequences to the middle ear. This latter is an important consideration, for despite all precautions and strict directions given to patients how to use the syphon douche, I have had cases in which the middle ear has, at any rate temporarily, suffered from its use. I have never known the slightest trouble in the ear to follow this inversion method, possibly because the patient is forced, in order to breathe, to keep the mouth open, and therefore cannot swallow during the time the fluid is in the nose. Inversion irrigation and the use of Gottstein's tamponade afterwards, seems to me to be an ideal treatment, and one adaptable to a very large number of cases.

---

* "Diseases of the Nose," 161.

In the milder cases where douching the upper cavities does not seem necessary, the douche recommended by Pinns, of Vienna,‡ is most useful, it minimises the danger of the anterior douche to the greatest extent, especially if modified as suggested by Dundas Grant,§ who recommends that the nasal nozzle be made small enough to allow of free reflux of fluid through the nostril, and as the patient, by the expiratory effort of blowing through one tube, forces a fluid through the other and thus through the nose, the effort of swallowing during the process is rendered almost impossible.

---

* Burnett's "Diseases of Nose," p. 662. † "Journal of Laryngol.," vol. 9, p. 8.
‡ "Central-blatt," vol. 7, p. 424. § "Journal of Laryngol.," vol. 5, p. 197.

For the removal of the laryngo-tracheal exudation, I have used intra-laryngeal injections of menthol in alboline, 20 per cent., and have found the treatment efficacious.

One other method for improving the nutrition of the mucous membrane deserves mention, the application of the Constant Current, as recommended by Delavan, of New York. I have adopted it in five of my cases, and have had some very satisfactory results.

Of Electrolysis I have had only a limited experience—two cases. Moure (Bordeaux) recommends it highly. I have followed his directions, using the bipolar method with a rheostat and ampèremèter. The use of the galvano-cautery is recommended by Fränkel, Morell Mackenzie, Sajous, and Lennox Brown, but other authorities, such as Bosworth, Schech, De Havilland Hall, object to its use. I have used it in five cases, and cannot say that I have found it does, as its advocates say it does, destroy the viscidity of the secretions and assist in the repair of the atrophic tissues.

Curettement is a treatment which seems to recommend itself on general surgical principles, and has the support of Spencer Watson. I have curetted 14 nostrils, and followed the operation up by the application of ichthyol and alboline. In most of the cases there did seem to be some tangible results.

The use of powders for the treatment of the interior of a moist chamber like the nose, has always seemed to me to be unphysiological, and in the treatment of ozæna, I think, the only exception should be made in the case of powders which stimulate the mucous membrane to secrete, or in some cases where the discharge is profuse and fairly liquid, an impalpable powder such as aristol, may be used with benefit. I have found aristol useful under those circumstances, but the heavier powders, such as the soziodolates, iodol, or aceto-tartrate of aluminium, are, I believe, positively injurious—that is, when used as powders. Lastly, I believe all obstructions, such as large spines, enlarged middle turbinateds, especially where they press upon the septum, should be removed. They only increase the tendency to the retention of the discharge, and by so doing, establish a vicious circle, which their removal breaks. I have operated on some 12 cases of this kind.

Dr. Kenny congratulated the Section upon, and thanked Dr. Hamilton for the excellence of his paper. The method advocated by Dr. Macdonald for nasal cleansing in these cases was new to him, though he had been in the habit of causing those of his patients who were suffering from disease of the antrum of Highmore, to lie on a couch with the head bent over and inclined so as to bring the affected side lowermost, and then to inject or inspire the cleansing lotion.

Dr. Jackson drew attention to the necessity of investigating the condition of the nose in cases of mucocele and granular lids.

CHRONIC GLAUCOMA.

By T. K. Hamilton, M.D. Dub., F.R.C.S.I., Adelaide.

The discussion of chronic glaucoma, which took place at the recent meeting of the British Medical Association in London, and which was introduced by Mr. Nettleship, has suggested to me that this might form a fitting subject to bring before our Section with a view of eliciting an expression of opinion from members on some of the many difficult questions which often beset us in dealing with this disease.

I find on looking over my case books a record af sixteen cases of this variety of glaucoma, or 0·2 per cent. of all my recorded eye cases. I propose to refer to some points of special interest connected with these cases, and in doing so I shall frequently quote, for the sake of comparison, &c., from a paper recently published by the two assistants in the clinique of Drs. Norris and Oliver, of Philadelphia,* which is the most complete clinical record of the disease that I know of, a veritable object-lesson in minuteness of statistical detail. I shall not make any attempt to draw conclusions from the comparatively insignificant number of cases I have collected, but they may serve to introduce the subject, and the discussion thereon will, I trust, prove to be both interesting and profitable. Norris and Oliver record 167 or 0·736 per cent. of all their cases. Men were found slightly more liable than women, and at the age of 50, of the two sexes, males are much more prone to the disease. "This," they remark, "is quite at variance with what one would expect, as the climateric, by its interference with the general circulatory system, would naturally be supposed to offer favourable conditions to the development of glaucoma. After the sixtieth year, both sexes seem to be equally liable. My cases bear out these statements; six are males, who average 50 years at the period of onset, and nine are females, who average 57 years.

Primary glaucoma seems to depend on various causes,—sometimes on systematic, vascular, or nerve disturbances. Of systemic disease, Norris and Oliver find that two, in particular, frequently play a prominent part—rheumatism and influenza. They are of opinion that the increase in the frequency of the glaucoma which they find to have occurred of late years is due to the deleterious action of the latter disease, as influenza has manifested itself with unusual severity during the past decade. Of my cases, three had rheumatism, and in eight of the rest, influenza comes in as a cause, at any rate, of precipitating the attacks.

Of vascular disturbances the menopause must be regarded to a certain extent as a predisposing condition, though, as we have just seen, chronic glaucoma does not come on at this period so frequently as one would imagine it should. In one of my cases, aged 45, the connection seemed to exist.

---

* "Archives of Ophthalmology," vol. 24, p. 379.

With reference to nerve disturbances. It seems quite clear that chronic glaucoma is not entirely a local affection, but an expression in many cases of a cause to be looked for in the nervous system. Worry or prolonged nervous strain have in this way come in as distinctly predisposing conditions in three or four of my cases.

Of subjective symptoms, next to failing sight—the cause which most frequently leads the patient to seek advice, —I find headache, with or without some accompanying ocular pain, is oftenest complained of. We are disposed to think and speak of chronic glaucoma as a painless affection, and so it is when compared with the other varieties, but we do very frequently see pain of a constant, aching, character persist until the tension be permanently relieved by operation or otherwise. The pain is generally referred to the occipital or temporal regions, and usually extends down towards or into the eyes.

In connection with the vision there are two subjective signs, in addition to the presence of the "halo," which I have noticed as fairly constant, the first is the difficulty the patient experiences in keeping up any sustained visual effort, either for distance or near, and this even before there is much peripheral vision lost. He emphasises the symptom himself usually, and tells you that after looking at something for a short time, he seems to be for a while very blind. This symptom, which is, I think, distinguishable from ordinary asthenopia, accommodative or otherwise, is suggestive of glaucoma. The second symptom is the apparent difficulty the patient has in discriminating between different glasses in the subjective examination of his vision, and here again this is noticeable in a comparatively early stage of the disease. This has sometimes been such a trouble that I have more than once had to correct the vision on the results of the objective examination, and ignore the patient's statements altogether. These two may, or may not, be of much clinical importance, but they seem to me to be worth referring too. In some cases, where there is no perceptible increase of tension, and few, if any, other objective signs of glaucoma, they may perhaps aid your diagnosis, or at any rate arouse your suspicions.

It would seem that no one of the objective signs most commonly observed in glaucoma is essential to the disease, for the disease may occur without an excavation, without the field being contracted, without the diminution of visual acuity, or without rise of tension. The excavation is, however, according to Norris and Oliver, the most constant symptom, occurring in 81 per cent. of their cases. In this connection they draw attention to a broadening of the scleral ring, which usually appears before the excavation, and they think its presence in eyes possessing other symptoms of glaucoma is always suggestive. I find a scleral ring, with a tendency to broadening to the temporal side, a frequent condition. The same writers note that shallowing of the anterior chamber exists in eyes where there is no excavation, but the converse is not true, for in every eye where there is an excavation the chamber will be shallowed.

An interesting question is which form of ametropia stands in the most frequent causual relation to glaucoma. Theobald thinks that astigmatism "against the rule," occupies this position.* Among my cases I have four of hypermetropic astigmatism, and three of these are "against the rule."

---

* "Trans. Amer. Ophthal.," Soc., 1889.

The different types of visual field restriction is also a point of considerable interest, especially as the extent and variety of the limitation is so often of great diagnostic and prognostic importance. Contrary to the observations of other authorities, Norris and Oliver find that the most frequent type of restriction consists in limitation of the entire field, and not in the contraction to the nasal side. They also find that as in quite a large proportion of cases the colour field is relatively more affected than that of form, this supposed diagnostic distinction between an atrophic and a glaucomatous excavation is valueless. The result of their observations as to concentric contraction quite upsets our present ideas on the subject, as we have always been led to understand that in the majority of cases the limitation begins on the nasal side.

In addition to this contraction we have in many cases an absolute or relative defect in the upper or lower half of the field, with its apex at the upper or lower margin of the blind spot. I find concentric contraction in four of my cases, nasal limitation in two, and sector-like deficiencies also in two, in one of which the defect is on the nasal and not on the macular side. Again, I have found that, as in testing for scotomata in toxic amblyopia, the use of small images, say a 5 m.m. disc, brings out the typical peculiarities better than the usual sized image.

Primary glaucoma sometimes seems to depend chiefly on individual peculiarity in the build of the eye, as Priestley Smith puts it, "microphthalmic eyes with healthy corneæ are prone to glaucoma." The average corneal diameter in nine cases which I have measured was just 11 m.m., one of them measured only 10 m.m.

That aphakia does not protect against glaucoma, even when an iridectomy is done, and that as a preliminary operation too, one of my cases furnishes a proof. The following is a brief record of the case. An old lady, apparently healthy, aged 72 years, presented the symptoms of chronic glaucoma in the right eye, she had tension +1, anterior chamber slightly shallow, and temporal pain coming down into the eye, with a lens almost ripe and bad p.l. A preliminary iridectomy gave temporary, and a subsequent extraction, permanent relief to the subjective symptoms, and raised the vision to f. at 0.5.m. About this time very slight rise of tension came on in the left eye, a preliminary iridectomy was done, and this kept the eye safe and comfortable until the lens matured; extraction was then undertaken under favourable auspices, as the tension was normal and p.l. good. The operation was smooth, and the eye got rapidly well. On the fourteenth day, however, the patient was attacked with influenza, and this at once precipitated an attack of glaucoma, increased tension, return of headache, and diminished acuity. She recovered with only $\frac{6}{36}$ and Jaeger 15.

The question often arises, What is the best method of dealing with a painful, blind, glaucomatous eye? An iridectomy is performed to relieve pain, and it sometimes fails. The case may not be suitable for sclerotomy, as the pupil does not contract to eserine; or, indeed, you will most likely have intra-ocular hæmorrhage after either of these operations. You have then to decide between neurectomy or enucleation. These latter are the two alternative proceedings, and we choose the one which we think best suited to each individual case. There seems to be yet a possible third alternative for such eases, as provided in the operation recently suggested by Parinaud, and which he proposes to call "Sclerectomy." I have performed it on one of my cases of chronic glaucoma, and have every reason to be satisfied with the result. The patient, a male, aged 52, had typical chronic glaucoma of the right eye (the individual with the 10 m.m. cornea above referred to). On the left side the chronic had evidently taken on the more acute form; the globe of stony hardness, large ciliary vessels, cornea partially opaque, lens cataractous, and two large ectasiæ of the sclera. The pain was not intense, but enough to keep him uncomfortable, and act thereby injuriously on the other eye. I performed a sclerectomy. The operation consists in removing a small portion of the sclera, about 3 or 4 m.m. in size, so as to obtain a cup-like excavation which reaches to the choroid or near it. The steps of the operation are to be found, most minutely described by the designer, in the "Annales D'Oculisque," vol. 113, No. 5. The eye soon became quite comfortable after the operation, the tension lessened, and the ectasiæ are now scarcely perceptible.

In connection with the nerve degeneration, so common in chronic glaucoma, a question has been raised in the minds of many, beginning with Graefe, who originated the idea, as to whether these cases in which the nerve is involved, and in which there is an absence of any very decided glaucomatous symptoms, whether they are really cases of true glaucoma, or only a peculiar form of atrophy of the nerve with cupping of the disc. The question still remains undecided, and, however we may theorise on the subject, it seems best in practice to treat such cases as if they were glaucomatous. Nettleship deprecates the habit of regarding these as something different from glaucoma, as he thinks by so doing we tend to induce in the surgeon an undue hesitancy in the treatment of chronic glaucoma as a whole, and, moreover, he gives it as his opinion that sooner or later in each case the truly glaucomatous nature of the disease will be established. In support of this latter statement I may be allowed to quote from one of my cases. A lady, aged 54, consulted me in April, 1894, for loss of vision of the left eye. On examination the optic nerve was found atrophic, but no cupping, and there was a patch of choroidal atrophy involving the macula. These conditions being sufficient to account for the loss of vision, and there being no suspicion of glaucoma in either eye—as the corrected vision of the right was practically normal—I merely corrected the vision of her good eye and sent her home. She returned in 18 months with well-marked chronic glaucoma in both eyes; tension + 1, deeply cupped discs, &c. The strictly unilateral character of the case, and the presence of a central lesion on the affected side, which precluded the use of the perimeter, may be perhaps urged as a reasonable excuse for making what the sequel has proved it to have been—a wrong diagnosis.

This brings me to that part of the subject which is at once the most interesting and the most difficult to deal with, I mean the treatment. Unfortunately optic nerve degeneration forms so large a factor in the progressive loss of vision in chronic glaucoma, all our best efforts in the way of remedial treatment are at times completely frustrated, and hence modern treatment seems to be now most usually directed towards anticipating degenerative changes in the nerve if possible. In the discussion which followed Mr. Nettleship's paper, the consensus of opinion was decidedly in favour of early operation, as strongly advocated by Mr. Nettleship himself, the operation in some cases—to be selected—even in the prodromal stage. But when the question of treatment of the later stages came to be discussed, a marked difference of opinion seemed to exist amongst those who spoke. Whether operation under these circumstances is useful or harmful, whether treatment by myotics should, or should not, take the place of operative interference, if it should, how long it should be persisted in, and how it should best be carried out; again, if operation be decided upon, which operation is the better, iridectomy or sclerotomy; these and other questions have, and still do, vex the minds of all of us from time to time. It is impossible under such circumstances, and in a subject beset, as this admittedly is, with so many difficulties, to generalise; but one of the dicta laid down by Priestley Smith, on the occasion referred to, does seem to commend itself to one's judgment, as containing most prudent advice; he says: "It is right to operate at any stage of the disease so long as there is any sight worth saving, provided that the patient's general condition does not forbid an operation, and that he, or his friends, have been given clearly to understand that the operation is the only means, but not a certain means, of avoiding blindness." Any experience I have had leads me to think that operation in chronic glaucoma is rarely harmful. it may not be beneficial, but we have some good results usually to show for the operation, even though the effects may not last long.

The next question is: Should iridectomy or sclerotomy be the operation? I think I am correct in saying that sclerotomy has never displaced iridectomy in the treatment of even chronic glaucoma. Each operation has doubtless its own advocates, but, I believe, the majority of operators at the present time adhere to the older operation, at any rate, as the primary procedure, reserving sclerotomy for the second operation, if such be necessary. For myself, I have always preferred iridectomy, and have done the operation ten times for chronic glaucoma. In only one of these cases did the operation leave the patient worse than he was before, and as the case presents some points of interest, I may be permitted to refer to it briefly. A rather broken-down man, aged 57, with chronic glaucoma, and more or less degenerated eyes, and rapidly failing acuity of vision. He had as well riband-like opacity of each cornea. I performed iridectomy on both eyes. On the left side the anterior chamber did not reform for some days, and soon after the eye became rapidly blind, with symptoms of violent pain, in other words, malignant glaucoma. Eyes with this corneal condition have evidently, as originally pointed out by Graefe, and more recently by Magnus, undergone a considerable amount of degeneration when this complication appears, indeed, the progress of malnutrition is so marked that Magnus proposes for this reason to call the condition "keratitis atrophica," but not until now has experience taught me that these eyes do not bear operative interference at all well.

The efficacy of strychnine, administered hypodermically, in the treatment of chronic glaucoma, deserves a passing mention. I have found this drug a most valuable adjunct to other treatment, and I believe I have obtained very distinct benefit from its use. I think strychnine improves both the general and local conditions in these cases. I find my patients eat and sleep much better when it is being administered, and they seem, by improving in nervous tone, thus to be able to rise above the mental and physical depression so often found associated with chronic glaucoma.

Locally, I think strychnine, possibly by augmenting the blood pressure, improves the nutrition of the retina, and this is the more readily accomplished when the tension has been relieved by myotics or operation. In one of my cases particularly, a very decided improvement in general health and in the local symptoms was found after some time of the combined treatment by myotics and strychnine. I give large doses, and push it to slightly produce its physiological effects, the dose ranging from gr. $\frac{1}{24}$ – $\frac{1}{10}$ once daily.

Lastly, on the subject of myotics; where treatment by myotics is sufficient, and the case seems to demand a prolonged use of eserine, a difficulty sometimes arises from the conjunctival irritation it causes. There are some eyes very susceptible to eserine in any form. I think I find the ophthalmic discs* better borne than any other preparation, next to them an ointment seems to be better than drops. The ointment recommended by Panas, eserine and pilocarpine with vaseline is a nice form of application. I have never as yet seen any injurious results caused by the prolonged use of eserine, but I know some dread its habitual use for fear that it should induce iritis. The weakest solution of eserine that will act is that which it is best to order, and its combination with cocaine is to be recommended.

PTERYGIUM.

By A. C. PURCHAS, M.B.C.M., M.R.C.S., Auckland.

In a paper read at Auckland Branch, I drew attention to a large amount of pterygium met with in Auckland. On inquiring into the origin of these cases, it will be seen that owing to the geographical position of the port, we shall always have arrivals from the South Sea Islands, more particularly Fiji, and that my experience has been that natives and Europeans from those parts usually supply the most extensive and aggravated forms of pterygium, and these cases, coming as they do from distant parts, have generally extended to a greater or less degree to the cornea. Having tried various methods and generally found a certain percentage that were very little improved by the usual transplantation method, I have recently been using an operation which is described as follows :—

Raising the pterygium in catch forceps, it is dissected away from the apex towards the base. The ocular conjunctiva on each side of the pterygium is freed and then stitched carefully. I find that I am using more stitches than formerly, and if the gap left in conjunctiva is very great I make incisions in conjunctiva above and below at right angles to line of pterygium near cornea, in order to prevent puckering, then taking apex of pterygium in fixation forceps, divide with scissors from apex to root into 6, 8 or 10 strips, and leave it to "wither." Antiseptic dressing afterwards.

Dr. Hamilton said pterygium was common in South Australia, and urged thorough curetting of the cornea after removal of the growth.

---

* I have found the "Ophthalmic Tabloids," recently introduced by Messrs. Burroughs, Wellcome & Co., a most convenient and always reliable form of application. They are very readily soluble, and are to be had of various strengths and in different combinations.

OPERATIONS ON THE MASTOID PROCESS IN CONNECTION WITH SUPPURATIVE DISEASE OF THE MIDDLE EAR.

By A. J. Brady, L.R.C.S.I., L.R.C.P.I.,

Hon. Surgeon Ear and Throat Department, Sydney Hospital; Member of the Laryngological Society of London.

Within the limits of this paper it would be impossible to describe in detail the different operations which are performed in this region, but I propose to discuss some of the newer procedures.

Within late years there has been a genuine advance in the surgery of the mastoid. This advance is mainly in the thoroughness with which diseased spaces are opened up, and the disease eradicated. In the earlier operations the fear of opening the lateral or sigmoid sinus, often restrained the surgeon from making a sufficiently free opening. Now, when pyaemic infection of the sinus is suspected, it is laid bare, and if found thrombosed it is opened up, the thrombus cleared out, and the sinus obliterated.

Operations on the mastoid are undertaken for the cure of suppuration of this process occurring in the course of acute middle ear suppuration, for suppuration of the mastoid occurring in the course of chronic middle ear suppuration, for the cure of otherwise incurable chronic middle ear suppuration. These three conditions require different modes of treatment. Acute mastoid abscess occurring during an attack of acute middle ear suppuration, such as frequently follows influenza, is limited, as has been well pointed out by Politzer, to the mastoid cells—here it is not desirable or necessary to open the mastoid antrum—the cells lying superficially can be opened by removing a comparatively thin layer of bone over the middle of the mastoid process. The diseased spaces are scraped out and irrigated with an antiseptic lotion, and the cavity packed with iodoform gauze, the suppuration generally speedily ceases, as does the primary disease in the middle ear. I have seen a copious purulent discharge from the middle ear come to an end in a few days after such an operation.

Of a different nature is abscess of the mastoid occurring in the course of chronic middle ear suppuration. Here the symptoms may have all the acute nature of those in the former condition. Every patient suffering from a chronic purulent discharge from the middle ear has probably also a suppuration of the antrum, which is in direct communication with the middle ear, but when the symptoms occur which call for the active interference of the surgeon, "the charge of dynamite," as MacEwan calls it, which the patient has been carrying about in his head for perhaps ten or twenty years, has exploded. The chronic disease has lighted up into a state of great activity, and the pathogenic organisms, if they have not already invaded the brain and neighbouring sinuses, will soon do so, if not interfered with by the surgeon.

All operations for the cure of pyogenic disease of the brain, or of its venous sinuses—the result of middle ear suppuration—must begin by the opening and drainage of the mastoid antrum. Here is situated the primary focus of the disease, and it would be useless to open an abscess in the temporo-sphenoidal lobe, or to clear out and obliterate a thrombosed sinus if the antrum were left full of a virulent pus.

The opening of the antrum from its depth, and from its relation to a number of important structures, is a much more difficult procedure than opening of the cells. Politzer advises that the surgeon should perform the operation at least forty times in the cadaver, before he considers himself sufficiently skilled to operate on the living.

In Vienna there are special facilities for operating on fresh mastoids, for which purpose Dr. Max has a very useful clinic. The bone is fixed in a vice, and the steps of the operation carried out as on the living. The electric light is used, and a forehead mirror to reflect it into the depths of the wound. The gouge and hammer, with sharp spoons of various sizes, are the instruments used to open the bone. The round-headed burrs, driven by a surgical engine, as used by MacEwan, seemed there not to have been heard of. The gouge and mallet were a great advance on all drilling and trephining contrivances, which did not allow the surgeon to inspect the wound as it proceeded, but the method of Professor MacEwan, of Glasgow, has several decided advantages, amongst which are the absence of jar to the head, and the smooth manner in which the bone is removed, allowing a clear view of the operation cavity as it is gradually sunk towards the antrum, so that the surgeon can the more easily avoid injury to the important structures which lie so near his track in different directions. The burrs used by MacEwan are large round-headed ones, made specially for this purpose by the S. S. White Dental Co., Philadelphia. They remove the bone in successive layers like the gouge,.only more smoothly, so that the operation is in no sense a drilling of the bone. The engine resembles an ordinary dental one, only an assistant drives it by hand. There is a multiplying cog-wheel gear connected with the handle and the driving wheel, to give greater speed.

In the clinic of Professor Urbantschitsch, of Vienna, the operation performed in chronic mastoid suppuration, is what is known as Zautfal's, or the radical operation. The incision of the soft parts is made to circumscribe the auricle. The soft parts with the periosteum are pushed forward, till the posterior and superior aspects of the bony meatus are laid bare. The posterior and superior portions of the membranous meatus are then detached from the bony canal down to the tympanic ring. The mastoid is then opened after the method of Schwartze, the passage between the antrum and the tympanic cavity is widened with a small sharp spoon, taking care to cut only towards the external aspect of the canal, avoiding the floor and inner wall, where the canal for the facial nerve and the horizontal semi-circular canal lie. A guard can now be passed from the antrum to the tympanic cavity, and the wedge-shaped piece of bone external to the guard, consisting of the superior third of the post-meatal canal removed.

Care must be taken not to remove the portion of the post-meatal canal towards the floor of the meatus, as this would endanger the facial nerve. The detached cartilaginous meatus is now drawn downwards and forward with a single pronged retractor, and Stacke's guard is passed into the attic, and with a fine gouge three millimetres in width, the bone forming the inner portion of the superior meatal wall and the outer wall of the attic, is now removed. The middle ear, attic, and antrum are now converted into one cavity. The tegmen tympani and antri are now free to inspection, and an extradural abscess can be evacuated, if present.* The posterior wall of the membranous meatus is now divided horizontally from the tympanic end to the concha, and this incision at its external end, is crossed by a vertical one. The flaps are then thrown back and retained in the operation cavity by packing with iodoform gauze through the external meatus. The object of the treatment is to bring about a lining of the former suppurating cavities in the bone with a layer of epidermis.

This operation is suitable for cases of acute mastoid abscess occurring in the course of chronic middle ear suppuration, or for the cure of otherwise incurable chronic middle ear suppuration, where no acute symptoms have developed. It is found to greatly shorten the period of after treatment in comparison with the Schwartze operation.

THE ÆTIOLOGY OF EPISCLERITIS.

By W. M. Stenhouse, M.D., C.M., Dunedin.

Although this is not commonly regarded as one of the more serious affections of the eye, it derives importance from the tediousness of its course, the tendency to recurrence, and the obscurity of its causation. Like many diseases with which we are acquainted, it is supposed to be always connected with a particular diathesis, and not to be in any respect idiopathic. The majority of authors, as we shall see, connect it with rheumatism, according to others it is frequently associated with syphilis, which other observers strenuously deny; others again attribute it to a scrofulous constitution. Berry speaks with more dogmatic force than most oculists, when he writes that in his experience it can only be connected with the gouty or rheumatic diathesis. To these causes Juler adds anaemia and dysmenorrhœa. All are agreed that it is more common in the female sex, with the exception of Nettleship, who affirms that it is far more frequent in males. Juler and Schweinitz alone of the authorities whom I have consulted, have noticed the coincidence of the disease with uterine derangements. But in my experience this is the outstanding fact, and explains moreover why it is—Nettleship notwithstanding—more common in adult women. My own experience, limited of course, does not lend any countenance to the rheumatic theory. Not only have none of my cases of episcleritis been connected with the rheumatic diathesis, but of all my cases of rheumatic fever, and they have been numerous enough, not one of them contracted the eye affection. On the other hand I have been long acquainted with the concurrence of this disease with affections of the uterus. Quite recently three cases have been under my care. The first, which had already lasted some eighteen months, occurred in a woman of 45 years, who had long suffered from a complication of uterine mischief, all springing out of a lacerated perineum, with prolapse, enlargement, endometritis, &c. The eye only began to recover when I put her under operative and medical treatment for the uterine condition, and is now quite well. The second case occurred in a young married woman, aged 26 years, with two children. She suffered from retroflexion, which had produced the common results of painful, enlarged, and prolapsed ovaries, and there was besides a laceration of the cervix uteri. The treatment of this case was difficult and prolonged, as owing to the tenderness of the ovaries a pessary could not at first be worn, and when this condition was relieved it was found that no pessary seemed to avail to maintain the uterus in place. It was therefore only after six or eight months treatment that a satisfactory condition was reached, and during all this time the eye gave no indication of improvement. But about two months after she was discharged from treatment, she was found to have become pregnant, and simultaneously the eye rapidly improved and soon became quite well. The third case occurred with a young unmarried woman, who had been reduced to a pitiful condition by an old-standing retroversion and flexion, with prolapsed ovaries. Owing to the same difficulties as in the former case, aggravated by extreme general debility, the treatment was protracted. It ended, however, perfectly satisfactorily, and with the cure of the uterine condition the cure of the eye proceeded *pari passu*. Several other cases I can recall in which the same connection between eye and uterus existed, but as these I either saw casually or did not have the opportunity of treating both conditions, and accordingly took no notes, I am unable to give full particulars. The occurrence of three such well-marked cases in a very limited field, would seem to indicate more than a mere coincidence between the ocular and uterine diseases.

---

* If present, the diseased malleus and incus must be removed.

If we grant therefore that a close connection exists between episcleritis and uterine disease, and if we also concede that it is in some way connected with the rheumatic dyscrasia, and it is difficult to avoid this conclusion, seeing that it has been noted by so many experienced experts, unless, indeed, they have been led to an erroneous conclusion by the traditional influence of earlier observers, such as McKenzie and Walton, it will be seen that there is a close analogy between the ætiology of this disease and certain others, which are said to derive their origin from a remote cause by metastasis, although the direct path by which this is accomplished has never been satisfactorily demonstrated. Of these diseases the principal and best known are acute rheumatism and valvular disease of the heart, mumps and orchitis, acute enteritis and enlargement of the glands of the neck.

The greatest amount of speculation has been directed to the connection between the joint affection in acute rheumatism and the cardiac disease which so often follows or accompanies it. Several theories have been advanced, of which the favourite hitherto has been that which ascribes to the rheumatic virus an affinity for fibrous structures. This leaves a good deal unexplained, as it does not account for the fibrous structures of joints, and of the valves of the heart being attacked in preference to other fibrous structures of the body, nor does it explain why and in what manner metastasis from the joints to the heart should take place, as was alleged by the older pathologists. To supplement the theory, therefore, it was found necessary to add to it by supposing that cold was the determining cause of its attacking joints, the joints attacked being those which are most exposed to the influence of cold, as the knees, wrists, and ancles.

The latest theory started, and the one in my opinion most accordant with ascertained facts, ascribes the joint and valve phenomena to muscular asthenia. It is pointed out that acute rheumatism attacks the young chiefly, especially those who are run down and who have been subjected to a long strain of over-fatigue. Accordingly those joints are attacked by preference which are most in use, the muscles controlling which getting fatigued by over-exertion, gradually become exhausted. This theory is equally applicable to the heart affection, for here we have a muscular organ in incessant action, and one which can never obtain complete rest, and, therefore, more liable to suffer from constitutional depression than any other organ in the body. But not only does this theory fit in with the condition of the heart, it is equally applicable to episcleritis. The seat of election of episcleritis it is well-known, is near the insertion of the recti muscles. These muscles are particularly liable to over fatigue in weakened states of the general system, and especially if much strain from close work is imposed upon them. If, therefore, episcleritis is really connected with a rheumatic diathesis, the same causes which determine the disease to attack the joints and the valves of the heart, are to be found in the eye affection.

As to an explanation of the connection between uterine disease and episcleritis, nothing more satisfactory than the vague term metastasis has presented itself to me. If the eye affection was always associated with a specific disease of the uterus and appendages, the connection would be regarded as one of propagation through the lymph spaces and vessels. As the cause of episcleritis must still be regarded as unsettled, although its connection with other diseases seems unquestionable, and as the whole course of the disease admits of easy observation, more accurate and acute study of all the phenomena attending it may reasonably be expected to throw much needed light upon the whole of that class of diseases in which organs remote from each other seem to become affected, as cause and effect, by some path of communication hitherto undiscovered.

ANTE-NATAL ADENOID GROWTHS AS A CAUSE OF DEAF-MUTISM.

By W. M. Stenhouse, M.D., C.M., Dunedin.

Like very many of my professional brethren, and a large majority of the general public, I used to believe that congenital deaf-mutism was due to some radical defect in the organ of hearing. Nor was this idea dispelled by the curious fact that in every case that came under my notice, I was assured by the parents that the child could hear perfectly well at birth, and make the ordinary attempts during the first year of an infant at the imitation of sounds and speech. There was always some story or other connected with the affliction designed to rob it of the element of disgrace, with which the birth of an imperfect or afflicted child is constantly associated in the popular mind. Sometimes it would be the story of an infantile disease, like scarlet fever or measles, at others the occurrence of an accident like a fall upon the head, or a sudden immersion in cold water. Now without entirely discrediting these as causes of early deafness, I confess that when deaf-mutism is established before eighteen months, I am always sceptical in regard to an assigned cause. But leaving all doubtful cases out of consideration, we know that a very large proportion of cases exist which are admittedly congenital, and it is to these that I wish to direct your attention. A large proportion of them, as you know, are the fruit of consanguineous marriages. In such cases it would be reasonable to expect some arrest of development in the organ of hearing itself, and especially some defect in the nerve of hearing. All these cases I put to one side, as I have had no opportunity of personally investigating them.

Of the rest the causes assigned for their occurrence are hereditary transmission, weak conditions of parents, scrofula, syphilis, climate, and the ill-health of the mother at a certain period of life. Having had an opportunity of examining several cases, three of them belonging to one family, I have now to suggest the addition to these causes of post-nasal growths occurring before birth. In the three cases alluded to above, an examination showed no sign of deformity in the external organs—the auricle, nor in the external auditory canals, which contained a small amount of wax. But in each case the membrana tympani manifested those changes which are generally found in chronic middle ear disease with obstruction. The membrane was bulging, of a dark purple colour, and evidently greatly thickened. In one case in which I cut into the cavity the membrane was of fleshy consistency, and so thick as practically to obliterate the tympanum, and this was the condition that I found more or less in all the cases that I have examined—six in number. By the various methods of inflation no air could be made to pass through the Eustachian tubes. The first case examined was a lad of 16 years, an inmate of the Institution at Christchurch. On examining for post-nasal growth a quantity was found; an operation was agreed to, and successfully performed. Some time after the operation the lad expressed himself as feeling freer about the head, and his parents thought they recognised an improvement in the direction of greater alertness and brightness. It was my intention to proceed with inflation by means of the catheter, but the patient, with the obstinacy characteristic of the deaf, would not submit to the treatment. A year or two afterwards I was called in to see a sister of his, a child of 3 years, concerning whom the parents had become alarmed, on account of catarrhal symptoms with deafness and discharge from the ear. On examination I found her suffering from post-nasal growth. An operation was at once undertaken, after which the discharge ceased, the deafness passed away, and there has been no recurrence since—three years ago. Subsequently I attended the mother in her confinement, and when the baby was a few days old, I made an examination of the ears and pharynx. These were normal, with the exception of a small amount of growth, very soft and pliable, in the post-nasal pharnyx, sufficient to show a tendency at birth to the establishment of this disease. This was scraped away with the finger, during which very free bleeding took place, but since then the child has kept well, and hears perfectly. Considering that there members of this family are deaf mutes, and that other two suffered from catarrhal symptoms and post-nasal growth, I submit that it is a very fair inference that the calamity of the former was due to the same cause probably occurring before birth, and nothing being done for the relief of the disease after birth, speedily ending in total loss of hearing. When the three deaf mutes were born the parents resided in a sea-side town with a very humid atmosphere, and while there, the mother herself suffered frequently from nasal catarrh, and the probability is that it was communicated to the children instead. This would point out the practical importance, when one case of deaf mutism has occurred in a family, of immediately examining subsequent children post-nasally. The removal of growth, if it is there, and I would recommend the removal of the smallest quantity, is easily effected either by the finger or a bent curette or spoon. I believe that the disturbance of the growth, and the bleeding attending this is sufficient in most cases to effect a cure by the retrogression of the disease.

In three other cases of deaf mutism belonging to different families, ranging from two years to ten, I found almost the identical appearances as in the one just described. In only one of these was an operation undertaken, and the result was practically *nil*. But had it been done as soon as the defect was known, I am inclined to believe that the result would have been different. After the disease has been established it is not to be expected that the mere removal of a quantity of post-nasal growth would be effectual. Repeated catheterisation is essential, and this I need scarcely point out is an almost insurmountable obstacle in the case of young children. From neither Valsalva's nor Politzer's methods of inflation would I expect as good results as from catheterisation. Safety, therefore, in all such cases, will lie in detecting the disease immediately after birth, in which case the removal of the growth would probably be sufficient to save the child from impending ruin.

NOTE.—At present I have under treatment a boy of two years who has been growing gradually deaf for some time. He comes of a deaf-mute stock. Under chloroform I removed a large quantity of growth, but the relief to the deafness has not been great, and the Eustachian tubes are still closed. These I expect to clear by another operation. Now it is quite evident that this child must have contracted the disease in utero or shortly after birth, and strengthens the deductions I have drawn in my paper.

Since writing the above I have been pleased to see that the subject has been mooted at Glasgow, but this aspect of post-nasal affection had not attracted attention prior to the reading of my paper.—W M.S.

MANIA AFTER EXTRACTION OF CATARACT.

By H. Lindo Ferguson, M.D., F.R.C.S.I., Dunedin.

As Dr. T. K. Hamilton made the remark to me the other day that he did not believe that mania ever came on after cataract operations unless atropine had been used, it has occurred to me that the following notes might be of interest to the Section, and I bring them forward in the hope of eliciting discussion on what must always be a very important complication in the after treatment of cases of extraction of senile cataract.

E. W., aged 82, was operated on for an immature cataract in the right eye, on April 10, 1891, at 4 o'clock in the afternoon.

The cataract was operated on because he could no longer get about, and in consequence of his age it was anticipated that the lens would be very hard. The operation was a low flap operation with iridectomy, and a considerable amount of cortex was removed after the extraction of the lens by the lid manœuvre. The operation was a perfectly smooth one, and only occupied six minutes, the patient counted fingers after it was finished.

The old man talked during the extraction, and chuckled over some small joke I made to distract his thoughts from what was going on. No atropine was used, and the eyes were bandaged and he was put to bed in the ordinary way, and there was no pain or discomfort up to 6.30 p.m. on Sunday, April 12, when Dr. Copland, the house-surgeon, saw him and re-adjusted the bandage which had slightly shifted. He then said he was all right, and seemed in his usual state. The eye was not uncovered, and the folds of the bandage were merely refixed, there was no atropine used. Dr. Copland reported that he was quite well and in good spirits. At 8 o'clock he suddenly started up in bed, tore off the bandage, and began to shout and yell loudly, disturbing the whole hospital. Dr. Copland was shortly on the scene, and found him fighting with everyone who came near him. In spite of his very great age and frail condition, he was only got into bed with the very greatest difficulty, and he succeeded in planting his foot in Dr. Copland's epigastric region with such effect that he lifted him over the end of the bed. He was given a draught which he spat out, and then was given $\frac{2}{5}$ gr. of morphia sub-cutaneously, which did not seem to have much effect, as he fought till 10.30 p.m., when he went quietly off to sleep. His pulse was then good and he did not seem much the worse for his exercise, but it was impossible to reapply the bandage. At 6 a.m. on Monday he was quiet and his pulse was good, he was then rational and seemed none the worse, but at 8 o'clock he became collapsed and died at 10 a.m., 66 hours after the operation. The sections of the wound are of interest as showing the repair at this early period after the operation.

About three years earlier I operated on D. T., aged 75, for a hypermature cataract of the left eye. The operation was a simple one, without iridectomy, and passed off smoothly. To prevent prolapse of the iris a drop of 4 gr. solution of eserine sulph. was put into the eye after the operation. The patient counted fingers and seemed very pleased at the result of the operation, and was bandaged in the usual way. Three days afterwards as I was leaving the theatre after another extraction, I heard a great commotion, and met the wardsman of the ward in which the patient was, in the hall coming for help. His report of the state of affairs was brief and to the point, as well as I recollect it was "Taylor's out of bed and raising hell." On entering the ward I found the old man with his bandage round his neck, standing in a short shirt beside his bed, brandishing a chair over his head and yelling "murder" at the top of his voice. He had been absolutely blind before operation, but he was now using the operated eye, and endeavoured to brain all who approached him. He could only be pacified by assuring him he could leave the ward, and dressed himself slowly, fishing out his clothes from the locker beside his bed while he kept an anxious watch on us to avoid any treachery on our part. He left the ward, but was tiring, and allowed Dr. Roberts to hold his arm, but when he was lifted in the hall, he struggled so that it took six men to get him into the padded cell, and as I walked home I was followed by his yells of "murder" for a block down the street, to emphasise my conviction that his eye was hopelessly lost. Next morning, after twelve hours delirium, he quieted down, and I found him later in the ward very sheepish and ashamed of having had suspicions of our intentions towards him which had made him anxious to leave at once. The bandage was not re-applied, and he got V. $= \frac{6}{18} + 10$ D. Pupil drawn up from a prolapse which occurred during the night of his attack.

I have had, I think, four other cases of mania after extractions during the last 16 years, of these I am sure two were due to the use of atropine, in another atropine had been used, and I cannot say whether it had been used in the other case or not. The notes of the two cases that I have read, however, are sufficient to endorse the impression that mania does follow the operation in some cases without any help from drugs.

ANIRIDIA. HIGH HYPERMETROPIA. COMPENSATING PARTIAL CATARACT.

By J. Lockhart Gibson, M.D. Edin., M.R.C.S. Eng., Brisbane.

W. C., aged 18 years, male.

History.—Sees badly, and light troubles him. Can read without spectacles, and is sharp at his books. No hereditary predisposition to bad sight.

Examination.—Well developed, healthy young man. Dark brown hair.

Left eye.—Iris entirely absent except to careful oblique illumination an infinitesimal trace, barely a hair's breadth, of a dark grey colour, to the inner and slightly lower side. Lens quite clear, and circumscribed by a fine red ring to reflected light, where the light gets into and out of the fundus without passing through it.

Right eye.—Nearly one-half of the iris, the upper and slightly inner part, is entirely wanting. The rest is a narrow band of the width of an iris nearly fully under atropine. The lens is quite clear, except a triangular section situated behind the inner part of the coloboma. Here there is a partial lamellar cataract, concave forwards, and apparently involving only the posterior fibres of the portion of the lamella or lamellæ affected. The lamella affected seems to be not the most peripheral. This opaque section of lens, also helped by the upper lid, reduces the size of the pupil pretty considerably.

Direct Examination.—Left eye fundus best through + 8 D.—particularly healthy looking.

Right eye fundus best with + 6 D.—quite healthy looking.

Test Types.—Left eye reads nothing at 20 feet. $\frac{6}{60}$ and Jg. 20 with + 8 D.—not improved further. Right eye reads $\frac{6}{24}$, and tries $\frac{6}{18}$ With + 6 D. reads $\frac{6}{9}$ partly, and Jg. 1. Left eye disused. Right eye helped slightly in bright light by faint smoked glass.

Ordered.—Right eye + 6 D.; left eye + 8 D., to be made of faintly smoked glass for daytime, and of clear glass for dusk. He has been very comfortable with these, and glare troubles him very little. I hope to see him soon to photograph, if possible, the right eye, and perhaps the left. He was unable to visit Brisbane to be photographed in time for the Congress.

The position of the opacity in the lens of the right eye is, from its position, suggestive of an attempt on the part of Nature to reduce the effects of the absent portion of iris; although the lenticular opacity, not being capsular, is an epiblastic fault.

FORWARD DISLOCATION OF LENS—TRAUMATIC MYOPIA—RETENTION OF ACCOMMODATION.

By J. Lockhart Gibson, M.D. Edin., M.R.C.S. Eng., Brisbane.

W. H. W., aged 33 years, male. Consulted me in February, 1895. History.—Blow with a cricket ball on his left eye five weeks previously. Blow was fair in the eye. The eyebrow was cut. Sight was immediately much reduced, but has improved since. Cannot see in the distance with left eye, but can see to read if he holds book a little nearer eye than usual. Previous to accident could see as well with left as with right eye in distance. In fact considered it the better of the two.

Examination.—Anterior chamber very shallow. Pupil about double the size of the right pupil. Anterior surface of iris equally and markedly convex with margin of pupil much in advance of periphery of iris. Pupil contracts rather sluggishly to light, anterior surface of lens supports iris in its displaced position. It is free from opacity to oblique illumination and to reflected light. Tension N.

With direct examination left fundus seen very dimly until − 3 D. behind mirror, and most clearly with − 3.5 D., even then not quite satisfactorily.

Right fundus seen perfectly with no glass, and even with a weak + glass right eye reads $\frac{6}{5}$. Left eye reads no letters at 20 feet. Reads best and $\frac{6}{6}$ partly with − 3.5 D., and Jg. 1 at 11 inches at furthest without a glass, and can read it as near as 6 inches with − 3.5 D.—*i.e.*, when his traumatic myopia is fully corrected by a concave glass, he is still able to exercise his accommodation as much as a normal eye at his age would be able to do. I saw him last in May, 1895. His lens was still clear, and sight remained the same. I have heard quite lately that there has been no alteration. The points of interest are the retention of the transparency of displaced lens, and very especially the retention of its power of accommodation for near objects. It is difficult to explain this last, as the lens could hardly be displaced to such an extent without rupture of its suspensory ligament.

ON EXAMINATION OF THE NARES IN THE ROUTINE INVESTIGATION OF VARIOUS LOCAL AND GENERAL DISEASES.

By W. G. Scott, M.D., M.R.C.S., Onehunga.

Among careful practitioners of medicine who would on no account leave out of their consideration any detail which they might consider could aid them in their researches in the matter of the diseases which they are called upon to treat, there are many who, considering that the study of the nose would be of no avail, entirely ignore this organ, and thereby limit their powers of diagnosis. I propose therefore to bring before you some of the evidence which, during the past few years, has been forthcoming to prove the remarkable relationship of nasal diseases with many affections of other organs and parts of the body, and from these data to enquire whether the facts already established do not force us to recognise the propriety of making an investigation of the nasal fossæ, as an almost invariable practice in the study of disease, however remote its connection with these passages may appear to be.

Of late years we have been imbued with the desire to see with our eyes, diseased parts wherever possible—a method of examination obviously of the utmost importance as being that least liable to error. For this reason such appliances as the endoscope, cystoscope, urethroscope, vaginal and rectal specula, &c., have been used with the object of enabling us to see the processes of the diseases we wish to treat.

Again, we look at the tongue, as we think that thereby we may derive valuable evidence relating to the state of the digestive organs.

We examine the eye, and determine thereby the presence of disease in the heart and circulatory system, in the brain and nervous system, in the kidney, &c., and confirm our observations relating to numerous constitutional diseases.

We examine the throat and larynx, and by this means obtain such results in the determination of tubercle, syphilis, lung, and other chest diseases, various nerve lesions, &c., as have given Mr. Butlin cause to state that "from the point of view of its importance to the general public, laryngology stands second to none of the specialties, gynecology alone excepted."

We do not hesitate to use the knife with the object of obtaining a view of the contents of the abdominal cavity.

In each of the foregoing cases we perceive the advantages of direct visual inspection of the field involved in pathological disturbances.

Hitherto, by neglecting the investigation of the nose, we have deprived ourselves of one of the most important means of diagnosis at our disposal. However, rhinology is now, I believe, able to give assistance to general medicine, equal to that given by any of the other means indicated, by revealing to sight many of the obscure processes of disease. At the same time the simplicity of the apparatus required in the prosecution of the study of the nares is as marked as the results to be obtained therefrom.

Many workers have been and are in the field, and were I to attempt to give the shortest account of their discoveries, I should occupy too much of your time. For my part, I do not propose to bring forward anything entailing original research, as from my limited experience any results obtained therefrom would be of no value; I therefore propose to shortly review the subject, at the same time laying more stress on those facts which have been verified in my experience.

Until about twelve years ago our knowledge of rhinology was extremely meagre, though anyone investigating the matter would be astonished to find how many observations had been, even then, recorded, presenting a series of unconnected phenomena, which prepared the way for further research.

Rumbold had observed melancholia, dissatisfaction, and inability to think consecutively as the result of chronic nasal catarrh; this was evidently Guy's aprosexia, which I will further deal with later on.

With regard to epistaxis we probably have little to add to the observations made at that time. It was shown to be due to altered conditions of blood, to increase of blood pressure, to atheromatous and other changes in the blood vessels, to ulcerations of the mucous membrane of the nose, to fibrous and other tumours of this region, and to acute inflammations, either simple or connected with various febrile diseases.

In 1872 nasal polypi were shown to be among the causes of asthma, and a great advance in the study of rhinology was made possible. From this time many allied affections, such as hay fever, irritable cough, dyspnœa, as well as hemicrania, brow ague, giddiness, nightmare, epilepsy, chorea, facial spasms, &c., were recorded as having an intra-nasal origin.

Gonorrhœal rhinitis had been observed. As for syphilis it was known to leave its marks on and in the nose from time immemorial.

The connection of conjunctivitis and keratitis with inflammatory diseases of the nares drew early attention to the frequent connection between diseases of the eye and of the nose. Conversely the blocking of the lachrymal canal was recognised as one of the causes of dry rhinitis with ozœna.

The frequent association of throat deafness with nasal diseases was at this time also acknowledged.

If we turn our attention from the remote past of twelve years ago to the present time, we find these observations have been confirmed so often by so many independent trustworthy observers that they no longer remain disconnected phenomena, but they, together with other discoveries, have raised rhinology to a firm position as a scientific specialty.

Since the first recorded case (by Votolini) of asthma being cured by removal of nasal polypi, so much evidence has been brought forward showing the almost invariable association of asthma with polypi, or other nasal disease, that Taylor, in his *Practice of Medicine*, rightly ascribes to surgery of the nasal and naso-pharyngeal region the priority over medicine in the treatment of this disease—and this view is now almost universally held.

It is clear that the study of ophthalmology would be incomplete unless a proper attention were paid to the nose, for certain cases of defective vision, the result of abnormal accommodation, defied all available means of correction until the nasal cavities had been restored to a normal state.

Conjunctivitis and keratitis I have already referred to as consequent on nasal diseases, and they will frequently not yield to local treatment until nasal catarrh has been remedied.

Glaucoma is said to have been relieved by stretching the nasal branch of the fifth nerve, indicating that this disease may sometimes be caused by intra-nasal disease. Cataract has often been found associated with nasal polypi, probably through trophic influence conveyed *via* the fifth nerve; and this may be the case in regard to glaucoma. Gradle says: "I recollect a number of cases of eye diseases either kept up or originated by nasal trouble. The first of these is a pseudo-erysipelas of the lids. It is entirely due to the irritation and engorgement of the blood vessels of the front part of the inferior turbinated body." He attributes also to trachoma and other ocular affections a nasal origin.

Martin declares that epistaxis of school children is an affection in the etiology of which eye-strain, in the endeavour to correct astigmatism, often plays a part.

It is believed by many that phlyctenular keratitis almost invariably has its origin in diseases of the nose. Ziem has shown that irritation of the nasal mucous membrane induces an altered circulation within the eyeball that at times leads to papillary hyperæmia, visual disturbance, increased tension, &c. This is an important observation, confirming from the point of view of the rhinologist many of the phenomena above mentioned, which were determined by the ophthalmologist.

Exophthalmos, both with and without goitre, has been said to have been cured, by more than one authority, by treatment of hypertrophic rhinitis.

Iritis, blephorospasm, &c., have been shown to so often have an intra-nasal cause that this should always be looked for.

The orbit may be invaded by enlargment of the frontal and ethmoidal sinuses displacing the eyeball, and by pus from the same sources.

Various brain affections are intimately connected with intra-nasal disease, as we should a priori infer, on account of the proximity of the nasal passages and sinuses. Hence we find the complex of symptoms, called by Guy aprosexia, a well-recognised clinical picture of dulness of intellect due to interference with the return of lymph from the brain, caused by blockage of the passages through the cribriform plate by adenoids or nasal stenosis. We have all seen the idiotic appearance connected with mouth breathing, and which is the facial expression of this affection.

The connection of meningitis, cerebral abscess, and phlebitis of the sinuses of the dura mater, with suppurative otitis, is known by everyone; yet too many, neglecting the fact that the invasion of the tympanum is almost always secondary to nasal and naso-pharyngeal infection, fail to extend their examination to the nasal passages.

We must now also, as shown by Greville MacDonald, admit the equally frequent invasion of the brain cavity by direct extension thereto of the products of inflammation of the frontal, ethmoidal and sphenoidal sinuses, numerous instances of this kind having been recorded by Symonds, Lennox Browne, Collier, Sandford, and others.

Headaches of various kinds, due to neuralgia, to septic absorption, or to direct pressure pain have been recorded by many observers as being connected with diseases of the nose and its sinuses. Cagney, in summing up an article on this phase of the question, says: "It is impossible to exaggerate the importance of the bearing of rhinology on medicine."

Loeb declares that frontal headaches, hemicrania starting about the orbit, headaches of which successive attacks are similar, those which originate in acute rhinitis, as well as those associated with obvious disease of the nose and its accessory cavities, point to a nasal origin.

Scheinmann says: "Most nasal diseases have only the symptoms of habitual headache, and by the cure of these nasal diseases the headache is also cured."

Collier, Dundas Grant, and many others might be cited as recording like cases of headaches of nasal origin.

We may now consider nasal reflexes more particularly. I have already mentioned many connected with diseases of the eye, and others such as those causing asthma, reflex cough, &c.

LIBRARY
No.

Merrick gives a recent *resumé* of this subject, and says: "While a few medical men are somewhat sceptical as to the connection between the treatment of certain intra-nasal conditions and the cure of so-called reflex actions in some more or less remote portions of the body, so many cases have been reported, covering such a wide field, by so many trustworthy observers, that I take it that the great body of intelligent physicians, among throat specialists at least, are united practically in believing the connection very close. Voltolini seems to have been one of the first to call attention to nasal reflex (in the matter of spasmodic asthma). This observation has since been abundantly verified. Seiler, Hack, and John Mackenzie subsequently brought out the fact that reflex cough was present in a certain percentage of nasal diseases. Ocular disturbances due to intra-nasal disease were in 1886 forcibly set forth by Gruening, Cheatham, Beverly Robinson, &c. Hack reports a large number of nasal reflexes, such as gastralgia, dyspepsia, cardiac palpitation, salivation, neuralgia, cephalalgia, migraine, ciliary neuralgia, and many other reflexes."

Bosworth reports cases of salivation, chorea, and epilepsy, cured by treatment of intra-nasal disease of which they were reflexes. Salinger and Fincke also record cases of epilepsy, F. A. McBride of psychical epilepsy, and Fisni a case of nocturnal enuresis. Many others have reported nasal reflexes, but the foregoing names and cases are sufficient to emphasise the reliability of the observations and the fact that a great variety of affections may be due to intra-nasal disease.

In confirmation of these statements we find that Roe states that the nose is frequently the seat of sufficient irritation to excite a variety of reflex manifestations. That the frequency with which epilepsy has been found to result from intra-nasal disease emphasises the importance of interrogating the nose in all cases of epilepsy.

Conversely irritation referred to the nose as the result of gastro-intestinal disturbances is well known, as also is sneezing caused by bright daylight and other reflexes. Otto records the case of a lady with enuresis nocturna, and treated ineffectually by any other means, who was cured by operating on adenoids. A recurrence was cured by galvano-cauterisation of a synechia between the septum and turbinal bone.

Harris records a case of traumatic epilepsy in which occlusion of the right nostril was produced by injury, and operation a year after the accident effected a complete cure.

I could give numerous other cases, including one of my own, confirming the frequent relationship of epilepsy with nasal disease, but further proof is not required.

Roquer y Casadeus of Barcelona declares "that it has been proved that the hysterogenetic zones as made known by Charcot are undoubted facts; that no one has called attention to such zones being localised in the mucous membranes;" and, further, he says "it has been proved that the hysterogenetic zones have a preference for nasal and genital mucous membranes, and he asks, since destruction of these zones are followed by cessation of hysterical attacks, are they not the cause of the characteristic disorders of hysteria, and not simply symptomatic?"

This author is, I believe, wrong in his second proposition, that no one has called attention to hysterogenetic zones being localised in mucous membranes, for Lennox Browne states that globus hystericus has its seat frequently in an enlarged lingual tonsil.

The connection between nasal disease and the sexual functions at the first sight would appear to be very slight. John Mackenzie, however, declares that the intimate physiological relationship which exists between the nasal and reproductive apparatus is partially explained by the theory of reflex or correlated action, partially by the bond of union which exists between the various erectile structures of the body; and he draws attention to the fact that in a certain proportion of women with healthy nasal organs engorgement of the turbinated corpora cavernosa occurs regularly at each menstrual flow.

Wyatt Wingrave, in a paper on atrophic rhinitis, says in females it was the exception to find them not suffering from leucorrhœa or amenorrhœa, and in every instance the nasal phenomena were intensified at the menstrual flow.

Lennox Browne states that clinically it is often noted that nasal affections become much more troublesome at the menstrual epoch, the symptoms are aggravated, and in ozœna the discharge is decidedly more fœtid; again, epistaxis in boys and girls and vicarious nasal menstruation are quite in accordance with the same hypothesis. Nasal diseases are constantly aggravated by sexual excesses. It is probable that the same fact obtains in connection with masturbation.

McBride appears to be disinclined to attach much weight to this subject, and says he has not personally observed the connection, but we must accept the positive evidence of the above-mentioned observers as having a preponderance over the negative statement.

When we consider the important part the nose plays in the functions of respiration, by warming, moistening, filtering and sterilising the air prior to its gaining access to the further respiratory tract, those functions which are entirely under the province of the nose, we can readily understand that when they are impaired or suspended all manner of respiratory diseases will result. Bosworth, than whom probably no one has paid more attention to nasal diseases, shows that chronic laryngitis, tracheitis, and bronchitis are almost invariably secondary affections to diseases of the nasal passages. Lennox Browne says in the main these statements have been verified by experience.

As a general result of nasal stenosis in the young we find a narrow undeveloped chest, general feebleness, and anæmia, due to inefficient æration and oxidization of the blood. That nasal stenosis is a potent factor in disturbing health must be patent to anyone who has observed a child suffering from such obstruction. Whilst asleep he will be found laboriously breathing, snoring, and becoming gradually cyanosed, until, with a start, he opens his mouth and obtains air through that channel. The condition reminds one forcibly of Cheyne-Stokes' respiration. Such a state of affairs must impede the due expansion of the lungs by interfering with free respiration; it lowers the vital energy, and predisposes the sufferer to the invasion of tubercle. At the same time the nasal obstruction causes stasis of air in the nasal passages, and the contiguity of the mucous membranes presents and provides a fine culture material for tubercular as well as other morbific germs, in which they may gain an entrance, and from which they may make further inroads into the lungs.

Tubercular disease of the nose itself has, however, but rarely been met with, though Straus has found tubercular bacilli in the crusts and mucosities of the nose, even in health. Mackintyre has shown that not only tubercular, but numerous other germs, are constantly present in this organ. Chiari, writing in 1893, declares that only twenty-one cases of tubercular disease of the nose have been recorded, and of these twelve are ascribed to auto-infection from sputum. Herzog reports ten cases, of which nine were under the care of Siefert, of Wurzburg; and I find there are a few others published, so I think Chiari must have underestimated the number somewhat. Volkman considers that many cases of nasal tuberculosis are diagnosed as syphilitic. It is therefore probable that if more systematic attention were paid to this subject nasal tuberculosis would not be so rare a disease as at present it appears.

I have for some time past examined the nares of all my phthisical patients, and although I have not found any appearance commonly associated with tubercular disease of this organ, I have been satisfied with the condition in a very small percentage, as I have almost invariably found obstructive diseases to which I think sufficient importance in the etiology of phthisis has not yet been attributed.

Suppurative diseases of the nose or its cavities are much more common than is generally supposed, and from this source we find not only inflammatory diseases of the cranium and its contents, which have already been alluded to, but also erysipelas of the face. It is probable, also, that by absorption of the products of suppuration, we may have general malaise, and even in some instances, neuritis, &c. In anæmia general prostration and other indications of septic poisoning, without any apparent cause I am convinced we should often find empyœma of the antrum or other sinuses. The pus when swallowed must also interfere with the gastric functions and cause dyspepsia.

Morell Mackenzie and others have noted that people of a rheumatic constitution are prone to nasal catarrh. It is known that asthmatics are particularly liable to catarrh. Bishop, Haig, and others have shown that hay fever is one of the effects of uric acid, and the same fact has been established is respect of asthma proper. Uric acid, then, is pointed to as the real connecting link between nasal catarrh and asthma. May not the presence of uric acid in the blood sometimes be due to insufficient oxidation, the result of nasal obstruction.

I have myself been brought face to face with the danger of nurses and others suffering from suppurative diseases of the nose unconsciously conveying septic disease into maternity and surgical wards. This hidden danger requires more careful consideration than has been given to it up to the present.

In this review I have purposely left out of consideration all diseases of the nose incidental to infectious fevers, such as measles, diphtheria, &c. Those general diseases which only seldom affect the nose, as cancer and other tumours, and those which have not frequently been observed as consequences of diseases of the nose such as hernia, insanity, &c.

I hope, however, that I have brought forward a sufficient mass of reliable testimony to show that diseases of the nose may have far-reaching consequences, directly from the results of the obstruction of the nasal passages, directly and indirectly by assisting the development of tubercular and septic affections, by causing various reflex disturbances, and by direct extension of disease along contiguous mucous membranes, and that, therefore, we should as general practitioners pay more attention to the nose than we have hitherto done.

SECTION OF PUBLIC HEALTH.

PRESIDENT'S ADDRESS—THE BATTLE OF LIFE.

By J. W. Springthorpe, M.A., M.B. Melb., M.R.C.P. Lond.,

Lecturer on Therapeutics and Hygiene, Melbourne University, Physician to Melbourne Hospital.

I beg to thank the Executive Committee for the great honour which they have done me in inviting me to preside over this important section of the fourth session of our Intercolonial Medical Congress. I venture to take it, not only as an undeserved recognition of attempts after sanitary reform in the past, but as a stimulus for the future ever to place preventative and educational medical work before even clinical record or therapeutic success.

In the difficult task of searching for a topic worthy your sectional attention, it seemed to me that I could not altogether miss the mark if I attempted to focus on the camera of the hour that ceaseless, restless conflict in which we physicians play the double part of advisers as well as combatants. For we live in an era when something much more than examining patients and concocting prescriptions is expected from professed healers. We must be, above all, skilled in knowledge of the causes of disease, and both wise and ready in their removal. A physician's view of the battle of life will therefore furnish the subject matter of my address.

Whatever our school of thought, few, if any, of us are likely at the present day to forget the material side of phenomena. Yet, in generalising about them, it is easy to fail to give due prominence to the great fact that they are all fundamentally inter-connected, differing at bottom only in arrangement, not kind, gradually evolved from the one common source, and governed by the same physical law of the ceaseless flux of atoms, with eternal conservation, if transformation, of energy. Existing always, so far as we know them, in connection with certain phases of this same matter, living things in their turn have their material basis, which brings them, too, under the same inherent influence. But they introduce into the problem that new factor, "life," the exact understanding of which baffles modern science as well as mediæval speculation. For Spencer's celebrated definition, "the continuous adjustment of internal to external relations," explains mode, not origin. Nor have the dualists the field so entirely to themselves as some imagine. The unvaried association of life with matter is a fact that must be accounted for, and though man cannot perform the miracle any more than he can transmute atoms into gold or baser metal, it is yet possible that, through phases many and unproducible, the material may in the end proceed to the vital, and life have an ultimate material origin. There are, indeed, those who hope some such solution of the problem when organic chemistry performs its anticipated task of the synthesis of the albumenoids.

Whatever be the ultimate truth, Darwinism has formulated for us the second grand generalisation of the final unity of origin of all the myriad phases of living things, differences in form being due to unlikenesses in their lives, carried on in unlike environments. Here, again, be it remembered, the description is one of manner, not of origin. There is nothing, in my opinion, to prevent this continuous readjustment being the mode in which design elected to proceed. Whether this be so or not, however, all living phases come under the same general law of constant struggle for existence, with final survival of the fittest, which, indeed, bears a suggestive resemblance to that which underlies all operations of matter. Thus, upon both material and vital sides (if they can be ultimately dissociated), all living things are inextricably bound together both in origin and development, and old astrology did but reduce a scientific truth *ad absurdum* when it linked human fate with stellar change. The ceaseless atomic flux and constant vital struggle thus necessitated constitute "the battle of life."

By virtue of his position, man takes his place at the head of the conflict, and in his fresh endowments of conscious mentality and free moral sense finds new elements of discord. For him, therefore, above all, life must be a battle —a battle in which, as we know, success means health, and defeat brings with it unnecessary disease or premature death.

As in ordinary warfare, other things being equal, the battle is won by the best selected, best trained soldiery, so in the battle of life the issue depends primarily upon heredity and development. The fœtus starts with its possibilities conditioned by the potentialities of the sperm and germ cells, each large enough to contain and probably made up of thousands of molecular representative of every part of the parent organisms. There is no gift given the young life that can compare with that of healthy parentage. Yet, by thousands of thousands the inherited momentum continues towards weakness, and Punch's question, "Why ever did you two marry; why didn't you give a fellow a fair show?" embodies one of the regrets of science as well as one of the jokes of the season. And the sacrilege will continue until the public at large come to know and appreciate it significance. Development, again, represents the progress of inherent activities in response to environment. For all living things there is a cycle of growth, development, decay, and death, of which inherited possibilities are the radius, and environment the circumference. We are thus brought face to face with the important questions of food, drink, exercise, rest, occupation, and the like, which are as much the essentials to healthy development as they are the commonplaces of physiology. As Solis Cohen puts it: To be well built, the organism must obtain sufficiency of proper material, keep current expenditure within the bounds of reaccumulation, and not impede the conversion of potential energy into kinetic. Want of requirements, excess of expenditure, depression of activities, however produced, must tend to a constitutional weakness that is fatal to the reproduction of strong cells and unable to resist the wear and tear of existence, much less withstand external aggession. It is undeniable that in other animals this development is generally well carried out in reliance simply on instinct, but it will not be denied that in man so many artificial conditions are introduced that some intelligent guidance becomes frequently a necessity. Specially is this the case with the sexual appetite, an instinct second only to that of self-preservation in importance and scope. And yet, though civilisation has accelerated its incidence and delayed its appropriate satisfaction, the disastrous silence of those qualified to speak leaves innumerable individuals either to become slaves where they might have been masters, or to fall into the meshes of quackery of the grossest kind. I have already taken advantage of two presidential occasions to emphasise this delicate question, and once again I venture to ask the profession to sow broadcast the explanations that carry knowledge, even though they do not of themselves promise complete control.

Ignorant, or regardless of the vital importance of the foregoing considerations, it is only when in the presence of the foe that most individuals even now think of the battle of life, and enter upon the conflict with a force raised anywhere, and trained anyhow. The battle itself we now find has to be waged man against man, man against other forms of life, and man against himself.

The domain of the strife of man with man is too well recognised to delay us long. There is no escape from the law of the struggle for existence. As Spinoza reminds us, the big fish were created to swallow the little fish, and the incessant border warfare of savage tribes shows how well man fufils his destiny. The commune follows the same law, though in different manner. Society, to quote again from Spinoza, is simply an organisation of the little fishes to protect themselves, and the strife continues between individuals, classes, and races. Against such natural law the devices of state-craft, and the educated selfishness of co-operation are but partial and temporary expedients, and, fortunately, perhaps, the physician is called in simply to help the fighter to fight better, though, in the "battle of the clubs" and the struggle for practice, he himself experiences its keenness. Will competition, then, never be restrained except by self-interest? Not, perhaps, from the material and vital sides, but surely by the development and spread of those higher considerations which some think are foreign to these lower relationships, and depend entirely upon man's peculiar moral endowment.

Man's conflict with other forms of life, however, is a subject more pertinent to the physician. As we have seen, the great law of the struggle for existence rules not only individuals, but species, genera, classes, and kingdoms. For his sport, use, or food, man preys upon the lower animals, and, wherever practicable, the latter return the compliment. In parasiticism we find an even closer inter-dependence and strife, each harbouring at its own risk certain organisms which may infect the other through air, food, or drink. It would surprise many who had not carefully studied the question to find how numerous and important are the diseases thus produced, and how large the number of human beings thus affected. For the present, putting on one side the question of germ diseases, man is said to act as the host of 8 protozoans, 51 helminths, and 21 arthropods. There are reasons, more or less strong, for associating cancer with protozoan invasion. The common round worm, the guinea worm, the anchylostoma, and the megastoma are all found in the intestines of other animals as well as man, and are undoubtedly interchanged from one to the other. In the different tapeworms—the beef tapeworms, the pork tapeworms, and the hydatid—we have alterations of form and effects with the difference of habitat, the mature forms inhabiting the intestine, and the larval condition being assumed in the internal organs. The trichina, again, which is the real cause of many epidemics, variously described as poisoning, rheumatic, typhoid, typhus, and formerly as black death, and English sweat, exists in man in both developed and undeveloped states, whilst the hog is its peculiar and original host. The disease thus produced is both extensive in amount and varied in manifestation, and, though some of the forms at least are well recognised, there is often need of special inquiry as to their possible presence in all obscure cases of nervous or intestinal disorder attended with anæmia and emaciation. Besides this interchange of parasites, and to a large extent owing thereto, man has found the lower animals of incalculable use for protection against the still subtler "germ diseases." It would be difficult, for example, to adequately assess the value of the calf in affording against so fell a disease as small-pox such a safeguard as we have in properly-performed vaccination. What, again, could exceed the value of the rabbit against hydrophobia, of the horse in the preparation of diphtheria anti-toxin, of the dog for tetanus anti-toxin, of the monkey in brain localisation, and of the guinea pig in the settlement of many bacteriological problems of the utmost importance? Vivisection, indeed, is justified by its results, even were sacrifice not the law of life, and killing for food, help, or sport unknown.

We are now face to face with that part of the battle which it has been the distinctive glory of modern science to discover, and to some extent already to regulate. Not unnaturally, perhaps, it has become too much the custom to regard all microbes as injurious, forgetful of the fact that there is another side to these activities, as is exemplified in their being nature's scavengers and earth's fertilisers, bakers of man's bread, brewers of his beer, makers of his vinegar, and flavourers of his wine, butter, and cheese. Indeed, without the presence of friendly germs in his intestinal flora, his food would not be peptonised, and in the midst of plenty he would starve. Another common error is the supposition that the invasion of the germ necessitates the production of the disease. This is no doubt true in certain cases, such as anthrax and certain pyococci, but it is generally the constitutional state rather than the presence of the germ which determines the extent of infection and the issue of the fight. Hence, while doing all that is possible to prevent invasion, and even attempting to kill the germ, so far as is possible without injuring the combatant tissues, it is still more important to fortify the outposts by promoting the healthy condition of the mucous membranes and bathing them in healthy secretions, and to build up the natural resisting power of the organism as a whole. And as the resisting power varies, so also does the virulence of the germ; both towards aggravation and towards attenuation. Nor is the struggle simply between man and germ; it rages equally between germ and germ, and mixed infection is by no means uncommon. As Lauder Brunton graphically reminds us, "even amongst these minute organisms the struggle for existence and the survival of the fittest exists. When two microbes are growing together, one may choke or destroy the other, just as weeds in a garden may choke the flowers. On the other hand, successive generations of the microbe may render the soil unsuitable for another, just as decaying algæ and mosses may furnish mould in which higher plants can grow. The struggle takes place also between the disease germs and the cells of the organism which they have invaded. This has been beautifully shown by Metschnikoff in the Daphne, where the process of the cells eating up the microbes, or the microbes destroying the cells, can be actually observed under the microscope. It is impossible to see one part of a microbe half digested whilst the part outside remains unaltered without believing that this process of phagocytosis is one of great importance At the same time it bears about the same relationship to the total struggle that a bayonet charge bears to a modern battle. The main part of the fight is really carried on at some distance by deadly weapons—by bullets in the case of the soldier, and by ferments, poisonous albumoses, and alkaloids on the part of the cells and microbes." Even this description by a master hand is not altogether complete. It says nothing of the immunity that may be artificially built up for a limited period by various manipulations of the germs themselves, and of the antitoxins which the system throws out in its hour of peril, which, strength for strength, are the exact chemical antidotes to the toxines, and the recent application of which in various disorders has been the crowning therapeutic triumph of the century. We are thus prepared for the, perhaps, surprising fact that it takes two factors—germ and susceptible organism—to produce the disease, and that the germ alone may be present in the mucous membranes, tissues, air food, or drink, without any necessary appearance of the disease. On the contrary, there cannot be the disease in the absence of the germ.

The list of diseases thus produced is a long and weighty one. It would include tubercular disease, actinomycosis, typhoid, diphtheria, cholera, measles, influenza, scarlet fever, relapsing fever, whooping cough, small-pox, malaria, pneumonia, erysipelas, gonorrhœa, puerperal fever, malignant œdema, ophthalmia, glanders, septicæmia, leprosy, with probably hydrophobia, syphilis, and rheumatism.

The bacteriologist is thus an essential assistant to the physician, and the help of the skilled veterinary surgeon cannot be overlooked without serious danger to the public health. Is there, then, any prospect of the sanitary millenium, when infectious disease shall be no more? We must first have dealt satisfactorily with all disease germs without, we must be able to control entrances and exits, or we must have become able to confer racial immunity. Then, and not till then, will the plague be stayed.

Even now we have by no means surveyed the whole battle-field. Man is something more than a harmonious entity, needing only healthy ancestry, sound development, and natural resisting powers, scientifically fortified. His organism is more complex than the continent of Africa, with its myriad inhabitants, manifold interests, and internal rivalries. A single blood cell (of which there are five millions in every cubic millimetre) may contain some half a billion molecules, in constant process of building up and breaking down, and in ceaseless interchange with their fellows of the fixed cells, the body heat being the measure of the amount of barter. Internal derangement, as well as external irritation, may at any time give rise to a molecular corroboree that may degenerate into an actual battle, wherein fever represents the heat of the struggle, pain the prayer of the nerves for succour, and discomfort or disease the outcome of the local engagement. How large a share of the minor conflicts of life is thus originated is well known to us all.

Again, just as the three parties to the United Kingdom were long at open variance, and even now are by no means always in accord, so the three strands which unite to form the human kingdom often disagree amongst themselves. The physical may, and frequently does, make war upon the mental, the mental upset the physical, both react upon the moral, and the moral throw all into confusion. The internal battles which accompany hysteria, hypochondriasis, insanity, and ill-balanced temperaments, and which produce dissatisfied athletes, mental cranks, and moral faddists, who shall describe?

It is impossible to pass over in science this portion of the battle which is waged in the very heart of the nature, the spiritual conflict. To me, at any rate, it seems more reasonable to assume that, in ultimate ontology, the material and the vital are but expressions of the spiritual rather than that the spiritual is their efflorescence, and that in man the spiritual endowment is a something superadded from without, rather than a phase gradually evolved from within. And, just as in these latter days we have arrived at the grand generalisation of the ultimate identity of all the drainage phases of matter, and also of life, so we are now able logically to proceed to the still grander generalisation of the ultimate identity of all forms of spirit in the External Supreme Spirit, of whom man's special endowment is but a particulate undeveloped portion, with power of development, need of environment, and manifold forms of expression. Whatever, however, be its origin, we still find that it has inter-relationships with the material and the vital; so that there are material causes for spiritual unrest and material factors in spiritual well-being. In addition, whether from the external introduction of what is known as "evil," or, as appears to me more probable, from conscious misuse of the inherent power of choice, and the necessity of development, struggle and effort are the necessary concomitants of spiritual life, and are found naturally to vary in amount in different individuals. In time the struggle spreads outside the individual, and under the form of persecution, or forcible proselytism, invades the already troubled nature of others. From the importance of the issues involved, the nature of the factors concerned, this battle-ground is necessarily the greatest of all. Its discussion and regulation, however, are so generally outside the province of the physician that I shall be readily excused from pursuing this portion of my subject further. Still, we will all do well to remember its material inter-relationship, and find therein a frequent reason for wise interference; and fortunate, and often trebly useful, must be they who either have the gift or have, by personal experience, won themselves the right upon this highest plane of all to attempt that readjustment which means health.

One caution, however, upon this internal strife as a whole. We should never forget the danger of sanctioning, or attempting to produce a fictitious harmony by the use of one or other of the various stimulo-sedatives. The apparent satisfaction is so great and so easily obtained. But it is not thus that sound readjustment is secured, or that broken laws are avenged. Such palliatives must ever rank secondary to the endeavour to satisfy the requirements in a natural manner, and to bring the individual into accord with a satisfactory environment. Administered in place of such attempt, the end is bound to be physiological bankruptcy, and abuse is wide-spread because the fool's paradise so obtained is so much more easily acquired than the slow regainment which follows sustained effort.

Such is the battle-field in which we are called to take part ourselves, and also to assist others. The important practical point is how can assistance be best given. Perhaps the answer can best be found in considering the question from the standpoints of the public, the physician, and the State.

Since the fight is one of conscious responsible beings, capable in themselves of independent action, and acting largely according to their extent of knowledge, the spread of sanitary information is of simply incalculable importance. Ignorance is without doubt the mother of an untold amount of preventable disease. Such portions, therefore, of the sanitary domain as are matters of individual action should be made matters of primary education, and be included in the curriculum of study by every boy and girl. How much longer shall such be taught the heights of mountains of no importance to them, and parts of speech that are dead, but unfortunately not buried, and yet be left ignorant of the importance of heredity, the requirements of sound development. the dangers to health and how to avoid them, and similar every-day health factors? It is a great gratification to me that I have been in Victoria associated with the introduction of such teaching into State and college curricula, and its certification in case of competency by authorities such as the local Health Society. And if I have stated my case in a way that carries conviction, I venture to hope that one outcome of this Congress may be the inclusion by your educational authorities of similar teaching amongst the subjects of study in your primary and secondary schools. In addition, the creation of a sanitary atmosphere that will surround individuals and permeate households is a matter of scarcely less importance. To this end the initiation and combined activity of such bodies of earnest and trained sanitarians as constitute Health Societies, St. John's Ambulance Association, Sanitary Associations, and the like, become hygienic duties and privileges. The tracts, wall-sheets, publications, lectures, examinations, certificates, and exhibitions (such as concern our Australian Health Society, I have pleasure in introducing to your further notice) cannot but be productive of a great amount of good. And I venture to commend such work for the public enlightenment to all those who are in a position to help. For the good does not stop short with individual strengthening; it is only by the spread of such knowledge amongst the masses that municipal authorities become alive to the sanitary problem, and sound progress is made by laws which are no longer too much in advance of public understanding.

With this spread of sanitary knowledge there is needed also a widening of the sphere of the physician's influence, for extended professional performance must accompany the broadening of public conception. The physician's usefulness must necessarily extend far beyond the remedial treatment of the sick. It will be more and more recognised that he is the trained servant of nature, able to do more preventatively than curatively, and more valuable by his advice than his drugs. It is true that a section of the profession already act upon this conception of their duty, but it is no less true that they form the exception rather than the rule, and that their efforts are still liable to be misunderstood or unappreciated. Yet the conception of the physician who can point out shortcomings of inheritance, defects in development, mistakes in environment, and avenues of danger, is after all the correct one. It would be difficult to over-estimate the gain to health if the public generally were educated up to the level of expecting, and the profession of imparting, wise advice upon these and kindred matters. As one example only of many, take the great question of tubercular disease, the disease so wide in its range that Playfair suggests therefrom the possible extinction of the human race. From an inquiry extending over several years, and now embracing several hundreds of cases, I am able to report that only a nominal percentage of those who have come under my notice had ever received any instructions whatever as to the necessity of destroying the infectiveness of the sputum, and thus prevent the disease from spreading to those in contact with the patient. And I know, unfortunately, of a large number of instances in which, after neglect of this essential precaution, one or more previously healthy members of the family fell victims to the disease. Again, how many children suffering from intestinal disorders are still allowed to drink unfiltered water and unboiled milk? How many sufferers from rheumatism are never told to wear wool next the skin? How many cases of neuralgia never know they might be cured by change of residence? The list might be indefinitely prolonged. Only by the inclusion of hygiene amongst the subjects of professional examination, and the progressive recognition of the doctrine that preventive medicine is superior to all else, will the profession generally fit itself for this extension of duties. It is satisfactory to note that progress is being made along both these lines.

Under the complex conditions of modern civilisation, however, even the best combination of individual knowledge and professional advice finds itself utterly unable to cope with the dangers that are constantly arising, and a State Department of Health becomes as essential as a State Department of Police, marine and soldiers. Everywhere this is now more or less recognised, and the only points in dispute are the manner and limitations of the State regulation. There are those who find the best settlement of this problem in the complete nationalisation and even inter-nationalisation of health, and certainly the tendency for some time to come must be in the direction of enlarging and strengthening the part taken by the State in these directions. But whether they will ever proceed, or even deserve to proceed, in Anglo-Saxon communities to the extent of entirely superseding the present voluntary system of disease regulation may well be doubted, and forms part of that still greater question of Communism versus Individualism which, fortunately, perhaps, does not call to us for settlement. Leaving, however, the problems of the position of the private practitioner, the growth of club and dispensaries, and the great sea of hospital relief to be dealt with as seems best by progressive development, and the survival of the fittest, there are still the great public questions of the registration and notification of disease, adulteration of food and drink, nuisances, surface conservancy, drainage, nightsoil, house construction, infant life protection, and regulation of industries, which imperatively demand State control. And since *Salus populi, suprema lex,* it is not too much to say that the State which neglects to deal officially with these matters fails to perform one of its fundamental protective duties. To my mind the proper attitude to take up was well exemplified at the International Sanitary Exhibition just closed at Paris. In proposing the health of the President of the Republic, the Dean of the Faculty of Medicine referred to faulty sanitation as a public danger, and urged the passing of a Public Health Act. The President of the Cabinet Council, in reply, held that it was the duty of the State to say to sanitarians, "Show us what to do and we will do it."

And, as an instance of a great community now prepared to act upon such expert advice, I can refer you to the proposed sanitary reforms in India, which seem destined to create a new era in sanitation in that vast and densely-populated peninsula. At the Indian Medical Congress, held at Calcutta in January, 1895, in an exceptionally able paper, entitled "The Medical Profession in India, its Position and its Work," Mr. Ernest Hart laid down the outlines of a scheme for the reorganisation of the sanitary services in India. Supported by the Local Authority, Dr. Simpson, the Health Officer of Calcutta, a resolution in their favour was unanimously passed by the Congress and presented to the Secretary for Home Affairs of the Indian Government, and the speedy and welcome result is the announcement that the Government are prepared to deal with the question along the lines suggested.

The lines themselves are so admirable that they will bear transplanting even to Australia. In the first place there are to be local sanitary departments, each under a special sub-committee of the local municipal council, and with a medical president and special local subsidy for sanitary work only, with, in addition, a health officer, an engineer, and sanitary staff as required, their duties being conservancy, water supply, building regulations, drainage, registration of births and deaths, vaccination, stamping out of infectious disease, and informing provincial authority by weekly reports as to the prevalence of cholera, small-pox, or other dangerous disease. Above these local sanitary organisations are placed provincial sanitary departments for the different great provinces, which, when a federated Australasia comes, might aptly represent the different colonies. These are to be provided each with a sanitary commissioner, an assistant sanitary commissioner, a sanitary engineer, and a president (who is to be a high Civil Service official); travelling agents, such as sanitary inspectors, veterinary surgeons, scientific agents; trained professors, and assistants in a Government laboratory for bacteriological, chemical, agricultural work, &c., and general sanitary investigations requiring laboratory facilities. The duties of these provincial departments are to institute special investigations at any particular spot on any particular subject; to make bye-laws and amend sanitary laws; to investigate diseases of men, animals, and plants; to analyse water, &c. At the head of all comes the Imperial Sanitary Department, consisting of a sanitary and an assistant sanitary commissioner, a medical statist, a veterinary commissioner, a sanitary engineer, and a Minister of Health as president, with a seat in the Viceroy's Council. The department is provided with a laboratory, with trained experts. Its duties are to advise the Council and Viceroy on all important health matters; the collection and publication of information upon epidemic diseases, both within and without; the right of asking the provincial governments what they propose to do and have done in checking or inquiring into diseases affecting man, animals, or plants, in their provinces; the arranging that all administration reports be drawn up on a uniform plan for ready reference; the acquiring of all information regarding the movements of emigrants, coolies, &c., and advising and requiring the provincial governments to take proper precautions; the consideration of new sanitary laws, &c.

The whole scheme constitutes such a splendid and imposing edifice for the proper State regulation and prevention of disease that it seems to me that this Congress would do well to bring the conception in its completeness and suggestiveness under the notice of our colonial Governments, and, through them, under the notice of our Federal Council. It is scarcely becoming that Australasia lag behind India in a matter of this individual and national importance.

Here must end, however, my imperfect sketch of life's battle and its waging. Enough, however, has been said to show that the part that may be taken by our profession in the extension of knowledge, the creation of a sanitary atmosphere, the treatment of the sick, the imparting of specific advice, and administrative or scientific work, is a noble and inspiring one. And, amidst all the drawbacks and disappointments which at times press so heavily upon us, it is more than repayment that, with Sir James Paget, we can claim for our calling from among all the sciences, "the most complete and constant union of those three qualities which have the greatest charm for pure and active minds—novelty, utility, and charity," and that we can compete with the world, not where wealth is the highest evidence of success, but "in the nobler ambition of being counted among the learned and the good who strive to make the future better and happier than the past."

Thus it is granted us by our labours to promote the gradual approach of that sanitary millenium when heredity shall be counter-balanced, development progress harmoniously, external attack cease from troubling, and internal disquiet be at rest, until, in the fulness of time, there shall be left only that last enemy, whose name is Death. Then, were man only the coping stone of the material, the perfection of the vital, naught 'tis true would remain but the redistribution of atoms, the reincarnation of the vital, and the oblivion of personality. But such negation neither scientific leader nor scientific laureate finds himself compelled to accept. On Huxley's tomb is deeply graven the trust that survives a true agnosticism, and from Tennyson's grave still breathes the century's crowning message of hope and faith.

SOME OLD TRUTHS ABOUT RURAL SANITATION.

By James Mason, M.D., F.C.S., D.P.H. Camb.

The truths—old truths—which I have to tell about sanitation, for some reason or other have not had their due importance attached to them, and the result is that the general public go on as if in entire ignorance of some of the most common laws which govern their well-being. New remedies are being placed in our hands every day, some of extreme value, many useless. The number which has survived the crucible of the general practitioner—and he in my opinion is the best of assayers—forms but a small proportion. It has occurred to me as it will have done to many of you that sometimes in our search for new weapons wherewith to fight the common enemy we have occasionally neglected to keep the attention of the public directed towards those measures which have for their object the prevention rather than the cure of diseases.

Let me not be understood to wish to depreciate or be wanting in admiration for those intellectual giants who are fighting for the advancement of knowledge, those pioneers who are gradually extending the domain of the known, who year by year lift the fair banner of science higher and higher in the face of danger, and often, shame that it should bo so, in the teeth of an opposition whose ferocity is only equalled by its unscrupulousness. Still, it may not be without advantage to have our attention directed to some conditions which obtain to a large extent in the rural parts of our country—conditions which are in direct opposition to all known laws of hygiene, and the removal of which would greatly enhance the commercial value of many of the members of our small communities if it did not actually avert death.

That prevention is better than cure is a true if trite saying, and in my opinion one of the chief glories of our profession is that although like Othello and other less known individuals we shall be without an occupation when mankind reaches the ideal state pictured by More in his "Utopia," yet have we ever been in the forefront of the army of preventatives.

From the earliest times the necessity of a plentiful supply of pure water has been recognised, and long before any exact data had been collected, long before science threw her search-light upon the *modus operandi* by which impure water caused ill-health, it was a well-known fact that disease and death always attended the use of a scanty or polluted water supply.

Great as are the schemes of the present day for the importation of pure water to cities, yet can we find their analogues, falling short by but little, whether we regard the difficulties to be surmounted or the mechanical knowledge displayed in overcoming them as far back as the days when

> The rich man helped the poor,
> And the poor man loved the great,
> When none were for a party,
> But all were for the State.

Justinian in his "Institutes" tells us that special magistrates were appointed to look after the conservation of the waterways of ancient Rome, and that death was the penalty attached to the act of defiling them. Since the memorable investigations made by Dr. Snow and Mr Netten Radcliffe into the causes which led to the outbreak of cholera in East London in 1866, from which 6,000 people died in the course of a few weeks, the record of which reads more like a page from the diary of Dr. Conan Doyle's creation—Sherlock Holmes—than a sober scientific report: how these gentlemen tracked out the man who defiled the river Lea; how they found out that at that particular time the filter beds of the water company were not in working order; how they showed that the disease was co-extensive with the area supplied by this particular company; since that time, I say, one inquirer after another has added fact upon fact until now the statement that cholera is essentially a water-borne disease is accepted by everyone who has studied the evidence. The same may be said with respect to enteric fever, and Mr. E. Hart, the talented editor of the *British Medical Journal*, has brought together a weight of evidence recently which puts this question beyond all doubt. Year by year the list of water-borne disease is being added to.

This Colony is fortunately as free from cholera as it is from those animals which it is said St. Patrick banished from the Emerald Isle, and, therefore, little need be said regarding it, but from that other equally preventable disease, enteric fever, there were in 1894, 115 deaths. This gives a death rate per 10,000 persons living in 1894 of 1·69, a very small percentage you may say, only a little over half the death rate from the same disease in England. One point, however, has to be remembered—a point the consideration of which somewhat mars our feeling of satisfaction. and that is the enormous difference between the specific density of the population here and that which obtains in England, here each man, woman, and child in 1894 had 93·39 acres, while in England each had only 2·01. When we further bear in mind that in some of the large cities the 2·01 acres falls to ·018 our surprise is that the death rate in England is so small.

A careful analysis of the Registrar-General's tables would tend to show that the mean temperature has little or no influence upon the incidence of enteric fever, at least, in those cases which terminated fatally, for in Auckland district, with a mean temperature of 59·7 deg. F., there were 29 deaths, while in Canterbury, with a mean temperature of 53·1 deg. F., there were 22 deaths, nor does the consideration of the specific density of the population afford much help.

I need not enter upon the question as to whether enteric fever can, as Murchison held, arise *de novo* from filth, for in the light of a greater knowledge, by the aid of a mass of data acquired since the time his celebrated work was published, it has been shown that filth *per se* cannot give rise to enteric fever, but that while it affords a suitable habitat and medium for the particulate entity which causes this specific disease, it cannot of itself bring it about.

I have drawn your attention to the fact that 115 deaths took place in 1894 from this disease, now if this loss of potential wealth—and it has to be borne in mind that man has an actual and ascertained value as a working animal—were all that the presence of this disease amongst us entailed, a simple question in proportion would settle whether it would pay to prevent it, but apart from the fact that one case may give rise to a thousand, we have to bear in mind that it means much more. In a recent epidemic which took place in Scotland—ably investigated by Dr. Monroe, medical officer of health for Renfrew—out of 859 cases 74 people lost their lives, which gives a case mortality of 8·61 per cent., in other words for every person who died there were 11·6 (say 11½) people laid down upon a bed of sickness lasting say two months. Let us assume the same case mortality (I believe it is much less) for New Zealand, and we find that 1,334 people were laid off work for a considerable time in 1894, omitting the cost of medical treatment, the cost of burying the dead, the possible depreciation of some of the survivors as wage-earning animals, and we find that like the old time sum of doubling the price of the nails in the horse's shoes, we reach a total which is somewhat astonishing.

That human life has a distinct pecuniary value is a consideration which rarely enters the mind of the average citizen. Nevertheless the matter is one susceptible of actuarial demonstration. A quotation from the writings of Farr, the greatest authority on the subject, will best illustrate the position of the matter : " As lands, houses, railways, and the other categories in the income tax schedules are of value because they yield annual returns, so for the same reason and on the same principle the income of the population derived from pay of every kind for professional or other services and wages can be capitalized ; not precisely, it is true, unless the income of every person were returned at least as nearly as incomes subject to income tax, but sufficiently near to the true value to show that the value of the population itself is the most important factor in the health of the country. . . . The capitalisation of personal incomes proceeds upon the determination of the present value, at anyrate of the future annual earnings at that and all future ages." The value to the community of an individual member was ascertained by deducting the capitalised future cost of subsistence of the individual from his capitalised future income. Proceeding upon these lines Farr arrives at the conclusion that the minimum value of the population of the United Kingdom, men, women, and children was £159 a head; that was the value inherent in them as a productive money-earning race. He estimated the value of the population of the United Kingdom as equivalent to a capital sum of £5,250,000,000, while the "capital" of the country (using the terms in its ordinary sense) amounted, according to Mr. Giffen's estimate, to £8,500,000,000.

I am not concerned to show, other than in a very general way, the vast waste of human energy and life which follows the use of an impure water for potable purposes, yet the evil results are so widespread, the effects so far reaching, and all the while so little appreciated by the public that I feel forced to remind you that the 115 deaths and the 1,334 people who were temporarily disabled from playing their parts in the "great game whereof the pawns are men"—as Carlyle puts it—represents but a small part of the loss which accrues from this almost entirely preventable cause. Not a few of the 207 recorded deaths from what the Registrar-General terms diarrhœal disease might be put down to the use of impure water, while a proportion of those who died from hydatid disease may not unfairly be assumed to have contracted the disease through water. As far back as the time of Hippocrates splenic and hepatic diseases were noticed to follow the ingestion of impure or marshy water. Many other entozoa find in water a happy hunting ground. According to Cobbold the *Bothriocephalus latus* enters by means of water, the eggs of the *Distoma hepaticum*, the *Dochmius duodenalis*, the *Bilharzia hæmatobia*, with many others find a suitable nidus in water. Let the acknowledged danger which attends the use of impure water be considered sufficient reason for attention being directed to the matter. And now let us glance at the state of things which obtains in most rural parts. I have carefully examined only a small part, but from what I can learn it does not materially differ from most other parts.

The water in this country is, as Cæsar's wife was required to be, above suspicion, and it is only when it comes within the reach of man that it ceases to deserve this same blameless character. We will best see how this pollution takes place, and how it could be avoided, if we consider the condition of one of the small towns with about 2,000 or 3,000 inhabitants.

The one I have in my mind's eye has nearly everything in the way of climate that could be desired, sheltered by the hills from the S. and S.E. winds, never even in winter does the temperature fall very low; fanned by the west winds laden with ozone and moisture from the ocean, in the hottest part of summer it is always pleasant and cool. The soil varies in depth from a few inches to six or eight feet, placed upon a thick stratum of gravel and boulders. The land has a gentle but continuous trend from the mountains to the sea. The sources of water supply are rain water, and that got by sinking the ordinary metal tube down to the water-bearing stratum. Practically speaking owing to the small provision usually made for the collection of rain water the main supply is that got from the pump. Properly placed nothing could be better, a water of almost Utopian quality and quantity is within the reach of every member of this community, but see how they misuse and destroy their natural advantage, what gross ignorance in many cases they display in the selection of the pump site, and the want of care displayed in the preventing of pollution from surface water.

The mere fact that water comes from a depth of 12 or 14 feet is no guarantee of its purity, for as Parkes has pointed out, some of the deep artesian wells throw up a very impure water. That percolation through 13 or 14 feet of good live soil will, in the majority of cases, destroy those agents whose entry into the water causes it to produce disease, is an undoubted fact; but given a backyard upon which all sorts of filth have been thrown for a considerable time, and one can easily see that the nitrification of the organic matter may be so far interfered with as to allow of contamination of the well water. This is all the more likely to happen, during or towards the end of a long spell of dry weather such as occurs in our country in the summer, especially, as is frequently the case, fissures and cracks are made through the unequal contraction of the soil The earth acts sometimes as a very imperfect filter. In sandy gravelly land the water passing through so quickly that little or no change beyond removal of the grosser impurities takes place. As an illustration of the enormous area which may be tapped by a pump I may mention that a well 30 feet deep was drained quite dry by another which was sunk some 150 feet away from it. Such a case as this teaches us that we must either keep the soil in the vicinity of our pumps absolutely clean, or sink them through an impervious stratum.

Let me remind you of a series of experiments made some years ago, having for its object the determination of the surface area, which an ordinary suction pump draws upon under ordinary circumstances. For some reason or other the areas were measured in terms of the well depression—that is, if the level of the water in the well fell one foot, the area drained would vary from 60 to 160 feet in all directions where the soil was composed of coarse gravel; in the chalk the distance would be 57 times the depression; in fine sands and gravels 15 to 39 times the depression; in chalk with fissures the distance is 57 times the depression; and in the new red sandstone, where extensive fissures exist, the distance is 143 times the depression.

As showing that these pumps, 10, 12, and 14 feet deep, are directly influenced by water deposited upon the surface, one has only to raise some water after a heavy rainfall, the water is thick and dirty from the admixture of earthy and other matter, so much so that on standing the sediment will often completely cover the bottom of the pail.

In not a few cases I found that a neighbouring creek was the sole source of water supply. In one instance the creek was only about 20 feet from the back door, the ash-pit and cesspool was close by the edge of the stream on the up side of the point where the water was taken from, old boots, decaying vegetable matter, and dead sheep were some of the ingredients of this truly primitive water supply.

Again, I found a family using the water from a creek which was simply a drain for a swamp in which at least six cattle had been bogged and lost, and into which the excreta of a house drained not 70 feet distant on the up side. Until about two years ago the occupants of the latter house also used this creek water, and only desisted because all the children suffered from "worms," as the mother expressed it. Since they ceased using it they have been free from these entozoa. The occasion of my visit to this part was in order to attend a child who was very ill, and who was continually passing *ascarides lumbricoides*.

I made a careful quantitive analysis of many of the waters, and in nearly every instance I found evidence of contamination, the albuminoid ammonia in several cases amounting to ·4 millegrames per litre, an amount which according to Wanklyn clearly entitles the water to condemnation. Generally speaking the amount of chlorine was small, but the large quantities of free ammonia, as much as ·932, prevents one from attributing the excess of albuminoid ammonia to simple vegetable contamination, and even were it due to this cause we have to bear in mind that water contaminated with vegetable impurities cannot be drunk with impunity, as witness the outbreak of diarrhœa which took place in the Leek workhouse.

The water on this occasion was found to contain 0·02 free and 0·36 albuminoid ammonia.

As one would naturally expect, there is a great amount of sickness among the members of this little place, and some years ago about 200 people died from enteric fever. Of late there have been a few cases, but fortunately they occurred in houses which were some distance from the centre of the village, and thus the disease was prevented from spreading. But it is not by the number of deaths alone that we should judge of the health of a community. If it were possible to obtain a record of the number of days each member had to forego the performance of his or her duty on account of ill-health, then would we have the best of all data for the forming of an opinion as to whether the conditions under which that community lived were bad or good. Such information with regard to large centres is unfortunately unattainable, except in respect to the members of the various friendly societies, but in the country, where every man knows every other man, it is possible to apply this standard of measurement.

I am fully convinced from a careful, if brief, study of the rural parts of the colony that almost all the ill-health we meet with is due to the ignorance and inattention to such matters as water, drainage, and ventilation. I would suggest that no pump ought to be less than 20 feet deep. If it is possible to drive the tube through stratum impervious to water so much the better. By this means you convert your well into a "deep well," and entirely prevent surface contamination.

No privy ought to be within 100 feet of the pump. If closer, the cesspool ought to be deeper than the well.

In cases where the ground slopes towards the house the well ought to be sunk between the higher ground and the house.

Bedchamber water ought never to be thrown upon the ground within 200 feet of the pump.

The ground, within a radius of 150 feet of the pump, ought to be kept scrupulously clean.

Rain water ought in all cases, where possible, to be used for drinking purposes, and the roofs and channels ought to be periodically cleaned, or a rain-water separator used.

I feel sure that were these few rules attended to a large portion of the sickness which now obtains in rural parts would cease.

And now let me draw your attention to another of the mistakes that is not unfrequently made in rural districts, that is want of scientific knowledge displayed in the selection of the building site. Most people have a more or less clear idea that dampness of soil and certain diseases often go hand in hand, and without committing themselves, or rather without troubling themselves as to how this connection arises, they endeavour to disassociate the two by building upon an elevated spot. What these settlers do empirically it is our duty to advise upon scientific grounds. The investigations of Dr. Buchanan into the influence of a damp subsoil upon the causation of disease of the respiratory and circulatory systems, have given a confirmation, complete and convincing, to this ancient belief. He has shown clearly the important part which dampness of the subsoil plays in the fostering and developing of the tubercular diathesis, and in words which are familiar to all students of hygiene, he has advocated thorough drainage of the soil.

The dangers attendant upon living over or in the vicinity of damp swampy ground may be divided into those due to the want of ærification of the soil, and those which arise from the action of those malarial organisms which at present are exciting considerable attention. The want of air in the soil interferes with the work of these nutrifying organisms, whose function it is to break up decaying animal and vegetable matter into their original elements, and the presence of the water in the subsoil has a marked effect in lowering the temperature. It has been found that by draining the soil the temperature in summer is raised as much as 3 deg. F., which is in effect the same as transporting the land 150 miles nearer the Equator.

The almost universal practice of raising the house upon piles is an illustration—often the only evidence of a belief in the harmfulness which accrues from this source. But what I want to draw your attention to is the inefficiency of the means adopted to secure the end in view. It is not unusual to find a well-built house situated upon the only elevated spot in an extensive swamp, the only safeguards adopted against the evils of such a situation being the slight elevation of the house upon piles. Only the most ingenuous need be required to express surprise that the inmates of that house suffer often and grievously from ailments, often slight, but sometimes serious. An important item which the builder has omitted to note is that unless he has introduced a damp-proof course between the ground and his house, he has simply erected a ventilating shaft for the surrounding swamp. That by as much as the temperature of the inside of the house, with its fires, lamps, &c., exceeds that outside, just to that extent does the house act as an attraction for all the maliferous particles which abound in these dark noisome areas. In the summer months, and during the heat of the day, there may be little difference between the internal and external temperature, but no sooner does the sun set than a more or less strong current sets in from all directions towards the interior of the house, and what the poet has termed the Englishman's castle becomes assailed and invaded by those countless viewless beings which inhabit the atmosphere, until, instead of deserving the title of castle, which implies resistance to intruders, it becomes an asylum which suggests a receiving house. If a man must live near a swamp much might be done towards obviating the disadvantages of such a situation by filling in the ground around for some distance with clean gravel or sand, in addition to the elevating of the house upon piles in order to permit of a current of air passing underneath it.

Far too little attention, to my mind, is paid by the small settler to the question of house construction, generally speaking the cubic space is far too small for the number of occupants. It is not unusual to find a young man sleeping in a room very little larger than an ordinary cab; a man, his wife, and four children occupying a room about the size of a loose box. Now, it matters little how genial the climate or how pure the air may be if for eight or ten hours we confine ourselves under such conditions as necessarily require us to inhale air laden with our own and other peoples physical *debris*, that is if we are to breathe at all. The evolution of some of these houses is very gradual. Often ere it is quite complete the more elderly parts of the structure have reached such a state of maturity that like the aloe, that lives but to flower, they refuse to remain in partnership with the latest addition. The hard-working settler who wishes to do well by the "lond," as the northern farmer puts it, has certainly little time to spend upon his house, and like Micawber he waits for something to turn up, for an easy time which rarely comes, when he can find leisure to finish it. Now what these men have to be told is that they are defeating themselves by living in this cramped unhealthy way, that they are incapacitating themselves from putting forth their best efforts by this nightly bath of ærial filth, and that the construction of a healthy dwelling ought to be the first and not the last matter for their consideration.

That this is an important factor in the causation of the anæmia, which is so common among the young women of the colony, I have no doubt.

One of the problems most difficult of solution which a large community has to consider is how to dispose of the sewage without injury to health. The larger aspects of the question, interesting as they are, I cannot here speak of, because of the parochial nature of my text. My talk is to the dwellers in the hamlet, not the fathers of the city.

In the many townlets—to coin a term—which are dotted over these beautiful islands there is no difficulty in acting upon the sententious phrase—"Rainfall to the rivers and sewage to the soil." But care must be exercised in the selection of the place of deposition. The practice of each member of the community acting as his own scavenger is one fraught with great danger to health. Where two or three are gathered together the safest and most economical plan is to adopt the pail system. In a land where kerosene tins are as plentiful as cheap oil is scarce there need be little or no initial expense, and the fee paid to the "worker in darkness" will be amply repaid in the increased freedom from diseases which arise from pollution of the subsoil. Wherever there is anything deserving of the name of a township the adoption of this method of disposing of the excreta ought to be made compulsory upon all the householders. There ought to be no individual election in the matter, as sometimes happens, because pollution of the water supply of several householders may result from the careless deposition of filth by any one of those self-appointed custodians of primitive customs. This, to my mind, is one of the most important aspects of rural sanitation, because if pollution of the subsoil be prevented there can be no contamination of the water supply.

And now, in conclusion, let me reiterate the salient truths which should ever be before the minds of those who, though not required to face large schemes in order to prevent disease, must, if they are to keep healthy, order their lives and surroundings in accordance with the laws of Nature. "Life," as Spencer has put it, "is the continuous adaptation of internal to external conditions," and whether we live in a city or in the country we must endeavour, in as far as we are able, to either cause our internal economy to conform to our external environment, or we may effect the same object by altering our surroundings. Exalted position has its disadvantages as well as its advantages, and nowhere is this better illustrated than in man's comparatively feeble power of adaptibility. In the majority of instances life can only be maintained by a bringing of his environment—that is, his external conditions, into accord with his internal. Just as every microbe has its peculiar habitat and optimum temperature, so has man, and he is only seen at his best when his environment most nearly approaches this ideal state of existence. Like the ignorant mother who stupidly attempts to adapt the infant to the food, rather than the food to the infant, man suffers by just as much as his external surroundings differ from his internal requirements. Disease and death follow the breathing of impure air and the use of unwholesome water. Air and water of an ideal quality every denizen of this Greater Britain has in abundance, and did he but use his birthright aright, he ought to have no difficulty in attaining and retaining that *corpus sanum* which we are told alone can give that highest of all blessings, the *mens sana*. The constant struggle for existence which we see going on around us we have to share, from the micrococcus to the amœba, the invertebrate to the vertebrate, the fish, the reptile, the bird, and the mammal, all have their battle to fight.

> Greater fleas have lesser fleas
>   Upon their backs to bite 'em,
> And lesser fleas have lesser fleas
>   And so *ad infinitum.*

By the conservation of the natural purity of the water, by the intelligent selection of the dwelling site, by the proper disposal of the excreta, and the thorough ventilation of the soil and living rooms the dweller in the country need rarely fall before he has run the allotted span. "We are such things as dreams are made of, and our little life is rounded by a sleep." Shall our dreams not be pleasanter; nay, may our sleep not be sounder if we order our walk and conversation in accordance with those laws by which microcosm and planet alike are governed.

ON EXAMINATION OF A POTABLE WATER FROM A BACTERIOLOGICAL AND CHEMICAL POINT OF VIEW.

By A. G. KIDSTON-HUNTER, Public Analyst, Dunedin.

The examination of a potable water is a matter of the greatest importance to public health, water being the medium by which many varieties of disease germs and ptomaines gain access to the human system, and for this reason periodical examinations, at least once a month, of all public water supplies ought to be made, under circumstances which will prove without doubt the purity or otherwise of the sample operated upon.

This examination, to be of absolute accuracy for health and sanitary purposes, must be made under two distinct headings—namely, bacteriological and chemical.

The first feature in the analysis presents itself in the sampling of waters, as the ultimate result of the examination depends upon the methods employed to obtain the samples.

The samples should be collected in chemically pure bottles—dark-coloured Winchester quarts are the best,—with accurately ground stoppers, the bottles well washed out with a sample, and then filled to the top, and stopper securely fastened.

If the sample has to be sent any long distance, the best method is to pack it in a case containing sawdust.

It is also important to label and mark the sample accurately, with note of time, date, place, and under what conditions the sample is taken.

When sample is taken from a city supply, the tap should be allowed to run for a few minutes, to get rid of any sediment in the pipes, before filling the bottle. If from a lake supply, the sample should be taken from the overflow part or where the water issues as a supply; not from the surface of the lake, for this reason, that investigations have shown, and in my own experience I have also noticed, the surface of any sheet of water, especially in direct sunlight, does not contain the same number of micro-organisms which are present in the great body of the water; so that there may be samples taken, one on a fine day from the surface of a lake, and twenty organisms found in it per c.c.; and upon a cloudy and windy day we may find a sample taken under precisely the same circumstances, give three or four hundred organisms per c.c.

The multiplying power of bacteria being so enormous under certain conditions, it is absolutely essential that the samples of water for bacteriological examination be collected under strict supervision, as in a sample collected under favourable conditions the organisms will increase so rapidly in twenty-four hours' time that it is of no value whatever for the purpose of reporting upon, and gives no indication of the original bacteriological contents of such a water at its source.

The class of waters has a special influence upon the multiplication of germs, as in absolutely sterile distilled water, or even pure filtered water, organisms will multiply and grow more rapidly than in actual dirty water. As an example, a sample of water which contained 41 organisms per c.c. when kept at 20 degrees cent. for twenty-four hours, developed thirty thousands per c.c.; whilst another sample which was highly polluted showed no increase in numbers from that originally present, and we note from this the purer the water is the more precautions are required to be observed in procuring samples.

Even packing the samples in ice, or exposing to the temperature of a refrigerator, does not destroy the power of growth of germs, as water placed in a flask sterilised and plugged with cotton wool, which contained 150 organisms per c.c. after seven days in a refrigerator, reached a total of 10,000; in this case, however, air was admitted.

This special feature of the increase in micro-organisms in pure and impure waters respectively may be noticed, and from the actual manner in which different waters behave we can almost conclude the original purity or otherwise of the same.

In a very pure water, of which a sample is taken and kept under favourable circumstances, the organisms present will develop very rapidly and attain a maximum number. In the course of a few days this is followed by a rapid decline in numbers; whereas impure waters, under the same conditions, will not exhibit such characteristic features, and may even require three or four weeks before maximum number is reached. This number remains stationary even after a lapse of years.

To keep a sample of water for twenty-four hours, and prevent changing of some of its constituents, is a very difficult problem.

These changes are referable chiefly to the organisms present, and their further development must necessarily be kept in check. To effect this I find that if the sample is carefully taken and air excluded a portion of the oxygen dissolved by the water is used up in the oxidation of the organic matter present.

This keeps the organisms in a medium to a certain degree unsuitable for their development, and therefore their growth is retarded. I have found this to be the case, especially when the nitrous bacillus or nitric micrococcus is present, and in the subsequent examination the growth of this organism is not noticed, as it does not develop in ordinary culture media.

If much organic matter is present, and there is only a small percentage of oxygen dissolved in the water, the multiplication of even this particular organism is retarded.

Now, having seen in what manner we are likely to get the best sample o the normal original water, we must consider briefly the method of demonstrating the number of organisms present in a known quantity. This is generally done by operating upon one c.c. of the sample, and inoculating portions of bouillon, gelatine, and agar-agar, and developing on a culture plate, a few days being allowed for colonies to grow at the temperature of 20 degrees and 37 degrees centigrade respectively. The colonies produced are then counted and calculations made accordingly.

Under the general theory that each individual organism gives rise to one colony, the system succeeds fairly well indeed, but I think this matter requires some investigation, as in some cultures I have made I notice that the same organisms will develop more largely in one part of the medium than in another, and as I am certain the medium is perfectly homogeneous, it is not owing to any difference in this, and therefore the conclusion I have formed is that when water is shaken it has a tendency to conglomerate the bacteria into masses which do not get separated again, and hence the stronger growth in some parts of the medium. My conclusions on this point have been verified by finding two distinct species of organisms existing and developing in the same colony.

As regards the temperature at which the development of ordinary non-pathogenic organisms takes place, I find about 20 degrees cent. the best for water examination purposes.

In my last analysis of Dunedin water I found an average of 30 non-pathogenic organisms per c.c., but was unable to detect any pathogenic species by the different methods I used.

The principal organisms existing in Dunedin water are :—

1. Bacillus Aquatilis Fluorescens.—This is an ærobic organism. It is a very short thin bacillus with rounded ends, and the colonies formed resemble a fern leaf with a lustre of mother-of-pearl ; it does not liquify gelatine, and grows on surface of medium only.

2. The Yellow Bacillus.—This exhibits, in gelatine tube cultures, a yellow thread-like growth, which penetrates the gelatine in a lateral direction, and liquifies the medium slowly, causing a funnel-shaped depression which holds a golden-yellow slime. On gelatine plate cultures small dots appear which are oval in shape, golden yellow in colour, and have a serrated edge.

3. The Orange Red Water Bacillus.—This is a very long thin bacillus, and grows on gelatine without producing liquifaction. It is, like the others, ærobic, and forms on the surface of gelatine red granular-looking colonies.

Besides these the nitric micrococcus exists in Dunedin water, as it does in nearly all surface and drainage waters.

The foregoing are the methods pursued in examination of waters bacteriologically, but I am of opinion that more elaborate and precise systems will require to be used before we can form a true and correct estimate of the worth of the various germs existing in a given sample of water.

As with one method only I hold it is simply impossible to demonstrate the total existing individual organisms in any sample at one time and under the same conditions, therefore I am devising a comprehensive scheme by which the various differences of life and growth of bacteria may be allowed for, so that under a series of cultivations made at the same time, but under different conditions, the various kinds of bacteria may be developed. I am also trying to formulate a method by which the products of decomposition caused by each isolated species may be analysed in the endeavour to prove the purpose and trace the life of the individual organism.

By the characteristic growth of bacteria under various circumstances we are able to classify them to a certain extent, and then, by the aid of the microscope, we further specialise them according to size and form.

As regards the first, there being such an enormous number of organisms, the question arises, Can more than one develop in the same manner? and we find this to be the case, as in working with the "Botrytis Tenella," a parasite of the mushroom, I find the cultivation in gelatine peptone media to be characteristic of Anthrax, but only in this particular, as the microscopic appearance varies.

The microscopical definition of an organism varies according to the manner in which the culture has been prepared and the method of staining.

The outer envelope of bacteria consists of a cellular tissue, which exists and acts as a dialysing apparatus through which certain substances diffuse and thus come in contact with the protoplasmic body. The size of this envelope is determined by the composition of the contents of the cell on the one side, and the strength of solution the cells are placed in on the other.

Organisms placed in pure distilled water will appear much larger than if placed in a strong solution of a salt.

This is explained by the fact of the osmotic force of any salt in solution within the cellular walls being developed according to the circumstances of the surrounding media, in this case pure water, without any salt to exert a like force. The result is the distension of the cellular envelope in proportion to the force existing, until by diffusion it is equal to that of the surrounding liquid.

In a bacteriological examination of water the worker will find that various conditions of light and heat cause a vast difference in the results obtained, and a few desultory observations on the difficulties presented by these variable and important factors may be of use to him.

In reference to the action of light under various circumstances, we find that there is a certain action in the presence of air, but among the published results of numerous investigators we can find no definite results following their experiments.

Some investigators have used sterilised flasks, into which a small quantity of infected liquid was introduced. These were then placed in a position in which direct sunlight reached them, and, according to the condition of the liquid, inference was drawn that the organism had developed or not, as the case might be.

As a result of these experiments, it was stated that, under favourable conditions, exposure to light entirely prevented the development of bacteria, and under less favourable conditions their growth was retarded only.

As the particulars of the conditions under which experiments were conducted were not taken into account, we can make no deductions of any value from this.

Experiments have also been made in reference to the action of the various rays of the spectrum on micro-organisms, and the result showed that bacteria exposed to red and orange-red rays had their development delayed only, whilst the blue and violet rays entirely prevented their growth. The question of the action of the violet and the blue needs fuller explanation.

It is admitted that all chemical action takes place more readily in the presence of these particular (chemical) rays, so that if the chemical rays act upon the inanimate matter in which the bacteria are placed, as well as upon the bacteria themselves, the result is necessarily chemical action.

This chemical action has for effect the oxidation of the inanimate matter to the detriment of the life and growth of the bacteria. It may possibly be due to the formation of small quantities of hydrogen peroxide, which has a very detrimental effect.

If we take the oxygen away from the organisms and place them *in vacuo* no action takes place, which proves that oxygen must be a factor in the change.

Another thing we find is that bacteria are more resistent to insolation when immersed in water than when surrounded by other media.

The temperature of solutions containing organisms rises considerably when exposed to direct sunlight, with the result that in some cases even a temperatnre of 50° centigrade was reached, which was sufficient to destroy some bacteria. This was attributed not to the sun's rays but to the high temperature produced in the solution.

Now, if this temperature was not caused by the sun's rays, what caused it? Chemical action. And what hastened that? No doubt the sun's rays. So that when we analyse this we find that wrong deductions have been made from these experiments.

Organisms consist principally of cellulose, and I have proved that when dry, cellulose has a great affinity for moisture.

When dessicated cellulose is placed in an atmosphere which has a large percentage of watery vapour, it absorbs this with great avidity and forms, I am inclined to think, a chemical compound of cellulose with two molecules of water, $C_6 H_{14} O_7$ since upon analysis of such cellulose dried at 102° C. the results show such composition.

Now, in the action taking place between the dessicated cellulose and the moisture a certain amount of heat developes, which causes the cellulose to have a higher temperature than the surrounding atmosphere, and this continues until the co-efficient of absorption is reached. Then the cellulose regains the temperature of the surrounding atmosphere.

This is a factor which must be taken into account when experiments are conducted with a view to ascertain different actions of heat on organisms, as it has been already proved that a certain quantity of a moist heat has a more deadly effect upon bacteria than the same quantity of dry heat—that is to say, a moist heat of 100° C. has a more powerful action in sterilising bacteria than 100 degrees dry heat.

In the former case a certain chemical action goes on, with the result that the germs themselves may have their temperatures raised even up to 10 degrees above this point; but special apparatus is required to measure this temperature, ordinary thermometers being of no use on account of the great difference in their specific heat as compared with cellulose. Therefore a method in which dry heat and moisture alternate will be proved to have a greater sterilising effect on organisms than a gradual extension of heat in one direction, in the same way that successive freezing and thawing has.

This alternation, attacking as it does the molecular constitution of the bacteria, appears to me to suggest a most suitable method of coping with the micro-organisms.

The bacteriological contents of a potable water, although the greatest factor in its sanitary aspect, may be so small that a chemical analysis will scarcely show their presence.

The purity of a potable water is gauged according to its freedom from contamination with vegetable and animal matter, principally organic substances.

As the organic compounds most to be feared are those which contain nitrogen in some form, the crucial point is the determination of the nitrogen present.

Free nitrogen, along with argon, is always present in water, and in conjunction with oxygen is no absolute detriment. Free ammonia is present in most waters to a small extent, but in pure spring waters is sometimes entirely absent.

The quantity of free ammonia present in a potable water should not be more than ·05 to ·08 parts per million. The quantity of albuminoid nitrogen, determined as ammonia, should not exceed ·10 parts per million. If even these proportions be exceeded the water should come under the heading of second-class. If the amount of albuminoid ammonia be large, say ·20 per million, and free ammonia only shows a slight proportion, say ·05, this water may be put down as being contaminated with vegetable matter; but if the free ammonia exist in a much larger ratio we may conclude the contamination to be from animal sources which will also be proved by the large percentage of chlorine in the water.

It is essential that the determination of free ammonia, albuminoid ammonia, as well as that of nitrates be executed so soon as the sample of water is procured for examination, as chemical changes are always taking place in water, especially in bottled samples, and altering the chemical composition.

I have found in Dunedin water that albuminoid ammonia decreases, and the free ammonia and nitrates increase, in a sample isolated for a few days.

A large percentage of nitrates present in a sample of water may have been caused by the surface water dissolving the nitrates from the soil in passing over it. The nitric ferment in such a sample may have oxidised the main portion of any free ammonia or albuminoids present.

I am arranging to keep a record of the rainfall in Dunedin with the view of analysing a sample of each fall in order to estimate the nitrogen in various forms contained in it.

Many of our inhabitants have no other supply than rain water, and from previous observations I am convinced that such investigation would be a useful record for public health purposes.

The other constituents of potable waters have been so thoroughly investigated that it is better to leave them out of consideration in a paper of this scope.

The main thing lacking in the chemical analysis of water at the present day is the absence of accurate estimation of the worth of the organic compounds existing therein, and I am of opinion that further research is necessary to enable us to understand and make proper deductions from a chemical point of view of the actions of these organic compounds on the human system.

THE PUBLIC HEALTH ASPECT OF ALCOHOL.

By Dr. W. A. Chapple, Wellington.

At no time in the world's history did the profession of medicine stand so high in public respect and confidence as it does to-day; and in support of this statement the many recent eulogistic public references of Lord Salisbury and Mr. Gladstone are pleasing testimony.

The somewhat sudden rise in public estimation that has attended the progress of the profession during the last two or three decades has been proportionate to and co-extensive with the advance of preventive medicine.

And to this advance in the science and practice of preventive medicine must be attributed, to a very large extent, at least, the present attitude of the public to our profession.

When, under the patient, persistent, and unwearying research of leading scientists diseases one by one yielded up the secrets of their causation, our profession gave its discoveries to the world, and taught to individual patients, to societies, and to the State, their practical application in the interest of prevention.

And it is not surprising that the respect and confidence, and even admiration, of the public should be powerfully stimulated towards a body of men who, notwithstanding the obvious fact that their very existence and livelihood depend upon the presence and prevalence of disease, consistently and unreservedly advocate the principles and practice of prevention for the relief of suffering, the cause of humanity, and the good of their fellow-men.

When we think of what this beneficient branch of medical science has done for our race—of the health-giving, life-saving acts it has placed on the statute books of nations; of the diseases it has banished or controlled; of the suffering it has allayed, and the lives it has saved; of protracted years of health and life with their accompanying increase of national wealth—we are dazzled with the wealth of human happiness and blessing it has showered upon mankind.

No wonder then, that public appreciation and respect are so fully extended to our profession that Fildes' great painting should be so universally regarded as the type of the modern doctor: that present-day novelists should so delight to portray the physician as the prototype of nobility and self-sacrifice, and that leading statesmen everywhere should proclaim our greatness and humanity.

All this contrasts strangely and markedly with the estimation and attitude of the general public a century ago, when novelists, artists, and play-writers held the physician up to ridicule and scorn as the incarnation of quackery.

To the rise and progress of preventive medicine above all else does the profession owe this place in the heart and confidence of the nation.

Preventive medicine deals with every preventible disease whose nature and cause are known and understood. Alcoholism belongs to this category, and deserves at the hands of this branch of medical science the same serious consideration as smallpox, tuberculosis, or cholera. It is quite as serious and fatal a disease, and much more widespread and intractable.

Let me say at once that, so far as I can see, it is no part of the duty of medical men, or medical societies as such, to deal with the various ways suggested by social reformers and politicians of dealing with the liquor traffic. It is no more the duty of medical men to advocate or oppose such systems as prohibition, high license, Gothenburg system, and so on, than it is to advocate or oppose different systems of drainage for the control of typhoid. A medical man, as a member of society, may take upon himself whatever social duties and responsibilities he feels competent or desirous of performing; but medical men, as such, and medical bodies owe no duty to society beyond affording instruction and guidance in the nature, causes, and prevention of preventible diseases, without reference to any means the State may in its wisdom see fit to adopt, based upon the lessons which medical science has taught. In this paper I shall adhere to this principle.

The subject of alcohol in its relation to health may be well worn—almost threadbare; but for the sake of our honour as a profession, and for the sake of our fellow-men accursed, diseased, and dying under its influence, we cannot afford to have done with it. For the sake of our own honour as a profession: for nearly every popular belief in the efficacy and virtue of alcohol is false, and our high authority is claimed in support of it—that it increases the body heat; that it adds strength and endurance to the muscles; that it is necessary to health; that it controls hæmorrhage; that it is a disinfectant, and protects from infection—all absolutely false; and the profession knows it! It is our duty to ourselves and to the public to correct these beliefs, or at least to say that they have not our authority. For the sake of our fellow-men: for it is as much our duty to save them from the ravages of alcohol as from the ravages of cholera, or any other preventible disease.

How great then is our responsibility.

That men like alcohol and hate cholera germs should not deter us from being true to our trust and our science and saying plainly that the one is as poisonous as the other.

The explanation of the hold that alcohol as a beverage has upon all civilised nations is to be found in the study and appreciation of its physiological action in the body. Not primarily in the vicious tendencies of men, nor in the craving for some form of narcotisation, nor in the mental and physical stress under present-day civilization.

The craving for alcohol, in spite of the ravages it produces in the human body, in the family circle, and in society, is the direct outcome of its own properties as a nerve paralysant when taken into the system, and alcohol must therefore be held primarily responsible for the human sacrifice associated with its use.

The effect of alcohol in the body may be considered either in its special or specific action on the brain, or in its more remote action on the other viscera, producing well-defined and distinct diseases, such as cirrhosis of the liver, peripheral neuritis, chronic gastritis, &c.

In its specific action on the brain centres, however, we have the explanation of its mysterious power over the individual to hurl him in spite of himself into social degradation and an early grave.

The first effect of alcohol in the empty stomach is to dilate the blood-vessels of the mucosa, producing a feeling of local warmth. The next is a reflex action on the vasomotor centre in the brain, leading to paralysis of the muscular coats of the capillary vessels, and accompanied by a feeling of superficial warmth.

At this stage the pulse is quickened, chiefly because of the diminished blood tension, and therefore of the resistence in the vessels. The cutaneous vascular dilation, though giving a feeling of increased warmth, is allowing of an increased radiation of heat and therefore of a diminution in the body temperature.

The presence in the brain of an increased blood supply is stimulating the mental faculties to greater activity, and the quickened cerebral circulation is conveying the alcohol in its unchanged state more rapidly to the brain centres.

The specific action of the poison now commences—viz., "paralysis affecting the nerve-centres in the inverse order of their development."—(Lauder Brunton.)

The highest brain centres are the latest developed, and these are paralysed first and most.

With the progressive paralysis now initiated there still goes on the hyper-activity by the increased blood supply of all the centres below, so that with the complete loss of power of the highest tier of brain cells there is the accompanying over-activity of all the tiers below.

The highest tier of nerve cells, developed last, and therefore most unstable, has to do with self-control.

The highest pinacle in a man's moral nature is the power to control or inhibit the suggestions or inclinations of his lower self.

It is this power of inhibition or self-control that is first paralysed by alcohol, and the paralysis is apparent at the earliest stage of alcoholic ingestion. A man who has just come under the influence of a moderate quantity of alcohol is at once noticed to lose his reserve, his self-restraint, his discretion; he becomes familiar, and because of the over-activity of all the centres below the one first paralysed he is talkative; he tells the secrets of his office, which, with his highest centres free and active, he would never allow himself to repeat; and in numerous and familiar ways he makes evident the fact that his power of self-restraint is to some extent temporarily lost.

Later in the stage of intoxication the next tier of brain cells goes, while the first tier remains functionless throughout, still more and more saturated with its poison. His moral judgment becomes dulled, and more of his self-control is given up. At first he was able to keep himself on good terms with his companions, but now he becomes quarrelsome, boisterous, combative, and unreasonable. He is unable to interpret correctly the words and actions of those around him, and, fancying his dignity is hurt, becomes offensive and perhaps violent.

Another tier is paralysed and some motor centres are gone; still, in harmony with the law that the nerve cells are made functionless in the inverse order of development, the highest and last developed suffering first and most.

The finest movements go first; the most difficult words and combinations cannot now be distinctly pronounced; the latest developed and most delicate movements of the fingers, such as are required at a piano or a game of billiards, are now impossible.

During all this time the lower centres (including those governing the animal passions) are in a state of over-activity.

Another tier goes, and the mind is a blank. Paralysis of all the higher centres is complete; the victim becomes insensible; the muscular power of the limbs gives way, and profound anæsthesia results.

If the alcoholic dose has been large, and still another tier paralysed, the respiratory function is lost, and the heart, whose centre is first developed, soon ceases to beat.

Accompanying this progressive paralysis of the nerve cells of the brain downwards is the dilated condition of the systemic blood vessels. There has thus been an increased supply of blood to the tissues, with a corresponding increase in oxidation ; for, though alcohol forms with hæmoglobin a compound that to some extent retards oxidation, on the whole the blood has become surcharged with the waste products of tissue change, and the stagnation in the blood flow, secondary to the stimulation, has prevented adequate elimination.

Thus at the stage of complete intoxication all the higher centres—moral, mental, and motor—are paralysed ; the nerve centres are bathed in blood saturated with alcohol, and surcharged with waste products, which the exhausted circulatory system and reduced vitality are not able to eliminate.

Upon recovery to consciousness, the flagging and loaded circulation produces an indescribable sense of depression, exhaustion, and fatigue, and the unhappy victim of a debauch is in the depths of unutterable misery.

Now, disregarding the incidental alcoholic diseases of the viscera, such as cirrhosis, &c., this brief description of an attack of acute alcoholism is an accurate epitome of a career of chronic alcoholism. Chronic alcoholism is simply an attack of acute intoxication spread over a number of years instead of a number of hours. The same physiological effect occurs—the same progressive paralysis from the higher to the lower centres; and the completeness of the paralysis is proportionate to the amount taken, just as the severity of an acute case is proportionate to the amount taken in a given time.

It is said by some authorities that the maximum quantity of alcohol a healthy man can dispose of daily, without ill effects, is 1½ ounces—if this amount be taken strictly with meals. This is known as the "physiological limit," and it is maintained that if this limit be uniformly and consistently adhered to throughout life, the degenerative action on the brain centres does not take place. This must, therefore, be taken as the true definition of moderation—viz., 1½ ounces of alcohol daily with meals.

How extremely difficult, and in so many cases absolutely impossible, it is for almost any man to keep within this limit through life, the annual sacrifice of human lives at the shrine of Bacchus abundantly testifies.

And why is it so difficult? Simply because alcohol possesses that dangerous and subtle property of producing an irresistible craving for itself.

If we analyse this craving, especially in the light of what has been said of its specific action on the nerve centres, we will see how impossible it is for any man—and especially any young man—to say that in taking alcohol he is not putting an enemy in his mouth that will steal away his brains.

In the first place, men must drink to satisfy thirst; and it is natural that they will (other things being equal) select the most pleasant, readily attainable, and enjoyable beverage.

The cunning hand of man has manufactured a beverage which has the peculiar property of giving an evanescent buoyancy of spirits and vivacity of thought, and of being pleasant to the palate, and has placed it ready to his lips in tempting and alluring variety.

It is not unnatural that men to satisfy thirst should accept this tempting potion, unconscious of the fact that though pleasant to the palate in the end it stingeth like a serpent and biteth like an adder. But few men at first realise the power of alcohol to beget an ungovernable craving for itself, and we can readily believe that no drunkard ever lived who did not at one time boast that he could " take it or leave it alone."

The first element in the crave, then, is the simple desire for liquid; the next element arises out of the discovery of the power that alcohol has of producing pleasurable feelings, exaltation of ideas, and of banishing cares and ills; a third element in the crave is force of habit; a fourth is the desire to relieve the depression following a previous ingestion; and the fifth, and most powerful and pitiable, is the loss of self-control which comes sooner or later from alcoholic paresis or paralysis of the highest brain centres.

The crave is not fully developed and irresistible until this highest tier, first and most degenerated alike in acute and chronic states, is paralysed and destroyed. Then all power of control of a desire whose intensity is accentuated by the pleasure of narcotization and the force of habit, is gone, and loss of self-respect, loss of position, loss of power and fortune, loss of family, loss of everything he once held most dear and sacred, pass under his review and are disregarded.

How can he control his desire when the inhibiting faculty is lost? The upper layer of his nervous system is paralysed, and he can now no more help his condition than an insane man can help his insanity.

He has now a diseased brain, and to fine him or punish him in any way is worse than useless—his inebriety, at first a vice, has become a disease, because of the alcoholic degeneration of his brain cells.

Later in the degenerative process the other layers go, and judgment, perception, and the higher intellectual, as well as the higher moral, faculties are deranged, unstable, or altogether lost. Many chronic alcoholics who, to the casual observer, never seem to be suffering through drink, have, nevertheless, lost their judgment, and their higher mental powers are dulled, making them quite incapable of discharging high and responsible duties with which they may have been previously entrusted. It is not uncommon to find captains of steamers with defective and unstable mental powers, allowed to carry on their responsible duties for months or years after gradual paralysis of their higher brain functions has set in, until some catastrophe reveals the alarming fact that the judgment and discretion for which they were once distinguished have perished in alcohol.

Many precious lives were lost before it was discovered that some men are colour blind, and similar precious lives are daily being lost, and we seem not yet to have discovered that in men who are constantly drinking to excess the higher and controlling brain centres are often so diseased as to make them quite unfit to hold responsible positions. The popular test is whether a man stands erect and walks straight. If he can pass that test he is deemed fit for any office of trust or responsibility, though a whole slice of the best and highest and most necessary of his brain centres may be utterly and irretrievably lost.

The specific action of alcohol on the nerve cells thus accounts for the degrading and demoralising results that attend its use, and further accounts for the power of the drug to create an irresistible craving for itself.

The susceptibility of the nervous system to this influence varies much in different individuals. In some of neurotic tendencies, acquired or hereditary, small quantities of alcohol produce rapid and powerful effects, and they soon come under its spell and develop the crave with all its appalling consequences. In others in whom the nervous system is not so unstable other organs appear to suffer most, and symptoms of the degeneration of these organs may remain uppermost, and obscure the extent of the nervous disease.

If this be the true therapeutics of alcohol, that it has a specific paralysing and degenerating effect on the highest brain cells which have to do with the function of self-control, that the rapidity of the degenerative process is proportionate to the quantity and the frequency of ingestion, and that, *pari passu* with this diseased change, a thirst for larger quantities to produce the same narcotising effects is engendered without any corresponding increase of brain cell resistance, then it is perfectly plain that the generally expressed opinion of the medical profession so freely canvassed and so often prostituted, that alcohol in moderation in health is harmless, must be modified if not abandoned.

From our knowledge of the physiological action of alcohol we are at liberty to argue that strict moderation is almost an impossibility, and, practically, we know that not one drinker in ten thousand keeps within the physiological limit of 1½ ounces daily with meals. The way that our cities, towns, and country districts teem with drinking bars is evidence of this.

Physiological moderation then, from the very nature of alcohol, is practically impossible.

It is true that some keep within this limit, but it is also true that some hate alcohol, and, though they try to take it under medical advice, find it impossible.

These are exceptions, with the great majority of men and women physiological moderation cannot be adhered to for any length of time, and, as a matter of everyday experience, we know well it is not, especially when the attempt to test it is made in early life.

If alcohol, taken even in the strictest moderation, has a constant tendency in all, and an overmastering tendency in some, to produce an irresistible craving for itself, it cannot be harmless. And so subtle is this influence that few detect its onset and growth until the brain cells are diseased and their owner a prey.

The best authorities are unanimously of opinion that alcohol is not necessary to preserve health in healthy individuals, and all that they concede in favour of its use is that it may be taken with impunity by many if the strict physiological limit be observed.

Lauder Brunton concedes that it is a food, but adds that it is an "inconvenient kind of food." He says: "Its claim to be deemed a food lies in the fact that taken with solids it is split up into its constituent parts in the body." But if this constitutes alcohol a food, KCN. and HCN. have also the same claim, and yet we know they are active poisons.

Brunton records Hammond's experience of adding to his weight by taking a little alcohol with an insufficient supply of food. But such increase in weight was no doubt due to the well-known property that alcohol has of diminishing oxidation.

The obesity of many drinkers is due to this pathological process, and not to nutriment conveyed to the body in the alcohol.

No article of diet that we know of has the peculiar property possessed by alcohol of creating an insatiable crave for itself; quite the contrary, the tendency of all articles of food is to create a repulsion for themselves.

The most modern tendency amongst authorities is to exclude alcohol from the right to be classified as a food.

It is no doubt true that many men have a scientific knowledge of the therapeutics of alcohol, and of its subtle power to control and ruin them; others at a very early age in their lives become conscious of this power by their own subjective experience, and constantly school themselves to severe moderation, and thus resist its influence.

Such discipline appears to strengthen their will power, and counteract the tendency to loss of self-control. But it is very doubtful if many can sustain the conflict through life.

Not only does moderate drinking constantly tend to develop into immoderate drinking, but the reports of life assurance and other societies abundantly prove that moderate drinking tends to increase the rate of sickness and to shorten life.

In a paper on the "Mortality of Total Abstainers in British Insurance Societies," Dr. Drysdale shows that in the United Kingdom Temperance and General Provident Institution, during the 24 years between 1866 and 1889, the actual claims in the Temperance Section were 70 per cent. of the "expected," while in the General Section the claims were 96 per cent., giving 26 per cent. in favour of total abstinence. The General Section accepting of course only moderate drinkers.

Dr. Drysdale further shows that in the Sceptre Life Association, Limited, of London, in 1892, the actual claims in the General Section amounted to 80·67 per cent. of the "expected," whilst in the Temperance Section the actual claims were 50·06 of the "expected," or 30 per cent. less deaths in the Temperance than in the General Section, the members of which were said to be of "very abstemious habits, so that here we have a fair comparison between the death rate of total abstainers and strictly moderate drinkers," and, further, that of 16,269 Rechabites (a society of total abstainers) the death rate was 7·4 per 1,000, and the number of days illness per member was 6·16. At the same date the mortality among the Foresters (a non-abstaining society) was 12·68 per 1,000, and the mean sickness per member 10·5 days. All other societies where comparison was possible gave similar statistics.

But much more must be laid to the charge of even the so-called moderate drinking.

A constant though mild saturation of the tissues with alcohol predisposes to many diseases, and renders the victims less able to withstand their attacks.

Most free drinkers attacked with typhoid, pneumonia, erysipelas, &c., die, besides being more liable to attacks than abstainers.

Dr. Newton Pitt found, *post mortem*, that about three-fourths of the cases of alcoholic neuritis, and about one-fifth of the cases of alcoholic cirrhosis of the liver had tubercular lesions; and that of 110 cases of alcoholic cirrhosis 23 showed tubercular lesions, while the chronic dyspepsia and other conditions of alcoholics predisposed to a high mortality from phthisis.

We might thus summarise the truths about alcohol taken as a beverage in health, in varying quantities, from physiological moderation to excess:—

1. Alcohol is a poisonous drug, whose special action in the body is a brain cell paralysant, destroying these cells in the inverse order of their development.
2. Alcohol disturbs the circulation, leading to a loss of body temperature and an accumulation of waste products in the blood, accompanied by great depression and muscular weakness.
3. Alcohol tends to produce in all, proportionate to the quantity taken, cirrhotic disease of all the tissues and organs of the body
4. Alcohol tends to produce an irresistible craving for itself.
5. Alcohol predisposes to all infectious and many organic diseases.
6. Alcohol diminishes the chances of recovery in those attacked with any disease, other than those resulting from its use.
7. Alcohol increases the sick rate, and shortens life.
8. Alcohol predisposes to consumption and all tubercular diseases.
9. Alcohol increases lunacy and crime.
10. Alcohol is absolutely unnecessary to health.
11. Alcohol promotes hæmorrhage, and does not check it.
12. Alcohol adds no muscular strength to the body; at most, it encourages the expenditure of its force in the shortest possible time.

If these are the true facts about alcohol taken as a beverage in health, we are, as medical men, individually and collectively, in duty and in honour bound to make them known to the public, over whose health we pretend to preside.

There is no reason why we should concentrate all our attention on the germs of cholera, tuberculosis, and typhoid, and discard alcohol—a cause of much more sickness, suffering, death, and wide-spread ruin and crime, than all these other diseases put together.

And we cannot claim as an excuse for indifference that the public know the nature and subtlety and danger of the drug. They do not; for, as has already been said, nearly every popular notion about alcohol is wrong, and as a rule we seem much too shy of correcting them.

Finally, the Right Hon. Mr. Gladstone said of our profession, in a recent speech, that we are a self-supporting body of men, whose independence had fostered in us a love for fearless revelation at all times of scientific truth.

We would belie that generous criticism if we failed to teach the lessons of this noble branch of our science to nations that groan under the oppression of preventible disease, of which the ravages of alcohol are so formidable a part.

Dr. Stenhouse said the subject of alcoholism was not one that he had given very much attention to. Dr. Chapple seemed to imagine that his case was true if he could show, on the one hand, that a moderate consumption of alcohol was not necessary to the health of the body, and if he could also show, on the other hand, that the consumption of alcohol in excess was detrimental to the body. But that was not sufficient; because if it could be shown that the moderate consumption of alcohol added somewhat to the pleasures of life, if it diffused happiness among mankind to some extent without being injurious, that was a great matter, seeing that we were not living in an ideal world, and that the world was full of ups and downs, of anxieties and sorrows of one kind or another. He was sure, from his own observation, that the moderate use of alcohol, on times and occasions, was beneficial, and that it enabled many a man to tide over a period of depression which otherwise might prove very disastrous. He had not the slightest doubt that the moderate consumption of alcohol after middle life was of considerable benefit, and that it was advantageous to the prospects of longevity. He believed that more men and women were hastened to their graves by excess in eating than by excess in drinking, and he had known many old people live for years and years who took a very small quantity of solid food, but took a small quantity of alcohol two or three times a day. While differing from the conclusions contained in it, he congratulated Dr. Chapple, who was an old pupil of his, upon his paper, which was well written, and showed that its author was animated by a desire to benefit his fellow men.

Dr. de Lautour, while agreeing with a great deal which Dr. Chapple had said, could not agree with his conclusions. He could not agree—because it was not his experience—that alcohol-takers were more liable to typhoid than water drinkers were, and he thought the statement was hardly reasonable, for they knew that typhoid was far more prevalent in children than in adults, and children were not drinkers. In his own practice at Oamaru he must say he had found—although his experience of typhoid was, he was thankful to say, somewhat limited, for since an efficient water supply had been introduced into Oamaru twelve years ago, typhoid and diphtheria had practically been banished—that the cases of typhoid were nearly all in women and temperate persons, and were certainly not amongst those who were consumers of alcohol.

Dr. Mason said the question of alcohol was one they ought carefully to consider, and especially when they recollected the way in which they hoped to be looked up to by the general public they ought to be very careful before they gave any verdict on the subject. Personally he was not a teetotaller.

LIBRARY
No.

He enjoyed a glass of beer and thought it did him good, and he had no doubt that it was only when alcohol was taken in excess that the verdict could be given against it. As long as a man kept within the bounds of moderation, and was restricted to a glass of beer or to a glass of whisky at night—especially when people got "on the other side of the hill"—there was no doubt it added to his enjoyment. If Dr. Chapple's line of argument was that they should individually immolate themselves on the altar of public benefit, the question was one that could be just as well discussed extra-medically as at an intra-medical meeting. Speaking from the physiological point of view he thought there was no question that the teetotallers had "the best end of the stick."

Dr. Mickle, putting forward his own experience, had come to the conclusion in regard to alcoholic beverages that all healthy people did not require them, and were better without them; but a very large minority of the population were undoubtedly benefited by their use. A very important point in connection with alcohol was the baneful effect it had on a large portion of the community as it was at present used, and he thought they should do all they could to discourage such a use of it. It was time that medical men took up a definite position, and that they discouraged the use of alcohol except as a food beverage. He had himself supported the Prohibition party in the past—simply to get a reform, and not because he was in favour of prohibition. The reform he would like to see would be that a license would allow the licensee to supply alcohol only as a beverage at meal times.

Dr. Symes thought their effort should not be so much directed towards preaching any such doctrine as prohibition as towards reforming the system that existed. That reform would, he thought, have to be brought about in many ways—such as by improving the present licensing system, which was very much to blame. The use of wholesome beer was a time-honoured practice—he might almost say a privilege—of Englishmen, but he contended that the beer supplied in the publichouses at the present day, particularly in the colonies, was not wholesome. The use of sugar and glucose in the manufacture of beer was most injurious to health. Many years ago, and for hundreds of years, while tea was still a very expensive luxury, beer was the national beverage, but it was a totally different drink from that now supplied in the public bars—no sugar being used in the manufacture. The small table beer was made purely from malt and hops, and contained only a very small percentage of alcohol; and he did not think the use of such a drink was conducive to habits of intoxication or to fondness for alcohol. If the Gothenburg system were adopted, by which beer would be supplied like postage stamps—by people who had no direct interest in the sale, some improvement might be made on the present system of supplying unwholesome and intoxicating beer. To his mind the use of such a drink as he had alluded to would be better for the public health than the immoderate use of tea.

Dr. Ogston expressed himself as being dead against Dr. Chapple's opinion. He could not agree with Dr. Chapple's statements with regard to the comparison between the abuse of alcohol and its moderate use. Alcohol was useful in small doses and harmful in big doses, but the same argument might be made to tell against tea. In thirteen years' practice at

Home he had seen the abuse of tea, and had seen more harm produced by it amongst women of the working classes than was done by it amongst men of the working classes. Like many other things alcohol was only harmful in abuse; in strict use it was not harmful. Stimulants were required to promote the digestion of food, and alcohol was not the only stimulant in use—mustard, pepper, and sauces were all artificial stimulants which were similarly used; and if there were not these stimulants, how many of them would succeed in digesting the overcooked mutton they got in country hotels when they went on holidays? He admitted that to certain temperaments strict moderation was impossible, but the persons of such temperaments were weak persons who needed restraint in other respects. The majority were not, however, so weakly, and to them, he maintained, strict moderation was not impossible. He was afraid the statement by Dr. Chapple, that no article of food created a craving for its excess, was too absolute. Death rates, he held, were ticklish things to tackle. Weakly-disposed persons were disposed to alcohol, but were their deaths to be ascribed to alcohol rather than to weakness of digestion which predisposed them to alcohol? He thought that the profession were all at one in the discouragement of the abuse of alcohol; but a very striking fact in history had been brought out lately in France showing that the moderate use of alcohol was not necessarily harmful, but that the immoderate use was. Since the phylloxera ravages, wine being scarce and dear, the Frenchmen had taken to alcohol in some shape or other—either in brandy or in a potato spirit made largely from brandy, or in absinthe—and now every return showed that there was more and more drunkenness in France. After reference to the evidence that moderation was possible in Austria, the speaker said he did not think the extreme step of absolute prohibition of drink would ever succeed, or that they as scientists could yet support it, though they might urge strict moderation.

Dr. Springthorpe said that as a lecturer on hygiene to the University of Melbourne he naturally had to go into this matter very carefully. It was a matter of great complexity, and although they all saw the evil effects of excess in the use of alcohol, he did not think Dr. Chapple had gone deep enough down. The fact was that the human race in civilized parts was not absolutely and permanently healthy. Every race on the globe seemed more or less irresistibly drawn to a stimulo-sedative of some sort—if it was not alcohol it was hashish, opium, tea, or some other stimulant. It was not merely a question of craving, it was an absolute instinct. He tried to fancy that the instinct was produced by there not being a proper adjustment between the individual and his environments, and by the use of one of these stimulo-sedatives the individual got a temporary adjustment—he got into a paradise for a time; it was a fool's paradise, of course, but it was the only sort of paradise he could get into. This for a time seemed to make a not perfectly healthy individual comfortable, happy, cosy, and until they gave him a better paradise he would get into this one. They might prohibit his liquor and he would go in for stimulant in some other form. In Ireland they went in for ether drinking, and there were cocaine-ists, morphia-ists, and all sorts of "ists." Take a healthy individual and a healthy environment, and then he would not want the stimulant; but until they did this he would continue to want it, and though they might prohibit it he would get it. Drinking was said to be the cause of many things, but he ventured to say it was rather the measure of extent of these things. It was said to be the cause of unhappiness, but he regarded it as the measure of the effort of a man to get into the happiness he had not got. Dr. Chapple's paper was the pathology of alcohol and not the physiology, and what they wanted was the physiology of it. It seemed to him that the prohibitionist did not go deep enough down—he saw the unhappiness and presumed that the cause was this one thing, which was not the only cause. The misuse was due to two things. The first was the temperament of the individual; and in that connection he said people of neuritic temperament ought to be warned against the dangers of alcohol. The second thing was the unsuitable environment. The over-worked and poor who were not in a happy condition and not likely to get into one—these were the people who took to liquor, and having once taken to it misused it. He pointed out that there was a difference between alcohol and alcoholic drinks. In proper ale there might be under 5 per cent. of alcohol—only one-twelfth the strength of whisky,—and in addition it would contain extractions of a perfect value. The spirit drinkers were the people who suffered from alcoholic neuritis; the beer drinkers rather got fatty. He held that the man and his age were to be considered in the discussion of this question. He thought nobody under twenty years of age ought to drink, except under medical advice, and it was better not to drink till after thirty. He regarded it is a matter of the first importance to keep drink as much as possible from the young, to make its form as suitable as possible to the individual and his environments, and to see that a thoroughly sound article was obtained. That was, he thought, the way in which legislation should go. At present, in his opinion, the Gothenburg system was the proper one, the State reaping the benefit of the sale, providing a pure article, only supplying it to the proper persons, and knocking out the confirmed drunkard and treating him as a diseased person, as he was.

EDUCATIONAL PROBLEMS AFFECTING HEALTH.

By WM. M. STENHOUSE, M.D., Dunedin.

It is not my purpose to inflict on you an elaborate paper containing a full exposition of my own views, but rather to provoke such a discussion as will elicit the opinions of others in such a way as to become serviceable to the public, and therefore tend to advance the national good. Naturally there are many questions relating to education, upon which members of the medical profession should of all men have something weighty to say. And yet it is patent to everybody that for the most part medical men are silent on this as on most of the other social and political problems of the hour.

The explanation is not far to seek. If a man wishes to be successful in his profession—and most men labour for a private end rather than from humanitarian motives—it is necessary that he should keep on good terms as far as possible with the entire community. This guiding principle which is termed tact has been laid down as the most important factor in a successful professional career, and the more highly it is found developed in any individual the less likely is he to give expression to his views on any subject if these are hostile to the current opinions of an influential section of society. Some of us in Dunedin are accustomed to give subscriptions in aid of a cause of which we do not approve—nay, distinctly disapprove — simply because it has the approval of Mrs. Grundy. Now, one advantage of such a Congress as this is that visitors from a distance are able to speak out their opinions with all freedom and boldness, having nothing to gain and nothing to lose in a community to which they are strangers. I trust, therefore, that many of you will speak out with no uncertain sound, and strengthen the hands of those of us who have been labouring for years with little encouragement in the cause of infantile humanity.

The first question to which I shall ask your attention is the age at which, in your opinion, founded of course partly on physiological grounds and partly as the result of your experience and observation, the education of children should begin. As I pointed out in Dunedin two years ago science and experience were thought to have settled this matter quite 50 years ago. From the end of last century until about the middle of this it was the custom among the more serious classes of society to begin the education of the child at a very early age, and to push on his studies with pride and satisfaction whenever signs of precocity manifested themselves. Two generations sufficed to discredit this system, which was fatal in numerous instances, especially to those children who required physical building up rather than mental stimulation; and where the process was survived it was found that the mental and moral results were too often disastrous, the infant prodigy becoming mentally inert and unproductive in maturity. Family physicians of large experience and acute observation simultaneously studied the question in all parts of Europe and America, and there was a very general consensus of opinion arrived at that school work should not begin before the age of seven. Accordingly, to the credit of the common sense and affection of parents, the old system was abandoned, and the child was left more and more to the gradual development of Nature. In New Zealand the school age has been fixed at five years; although not then compulsory, all schools are open to receive children of that age, and large numbers are in attendance. After a good deal of experience I am decidedly of opinion that this age is too early, and that the results in the long run are detrimental, especially to mental proficiency. Such children will never possess much original mental power, but will have to go all their lives in mental leading strings, so to speak. They have lost the power of thought and reflection in the multiplicity of subjects and details with which their young brains have been overwhelmed.

The great fault of modern systems of education is to confound knowledge and education as synonymous, the fact being that a man or woman may be crammed full of knowledge, and after all be nothing better than a learned blockhead. Now it is quite obvious that when school work is begun at a very early age, say five years, it is the memory chiefly that must be exercised, the higher powers of the mind, as imagination, reflection, reasoning, being then little, if at all, developed. But if one portion of the brain is unduly stimulated the other portions are proportionately dwarfed, and never afterwards reach the stage of development they might otherwise have attained. Hence the early stimulation of the memory is directly antagonistic to the growth and development of the higher powers of the mind. The physical effects of mental work upon children are hurtful. I need not point out to you, gentlemen, who are trained physiologists, that mental work is far more exhaustive to the system than the same amount of muscular work. This is a truth that few schoolmasters realise, and hardly any parents. One reason for this density being that the ill effects are not immediately visible. But they come, especially in the case of female children, with the certainty of an avenging and inexorable Nemesis. Now, gentlemen, if we, as medical men, would speak out the truth in this matter with force and unanimity the governments of the world would be only too glad to listen to us, for think of the saving that would be effected if the school age were raised to seven years. But worse is still to come. The latest popular and fashionable fad is the kindergarten. It looks a very pretty pastime indeed, and being new comparatively, it has seduced the affections and judgments of a great many very ignorant people, and of some men and women who are both intelligent and educated. But, gentlemen, we must condemn it unequivocally, and we can do so without any reference to its merits as a system, but only inasmuch as it seeks to put infants under restraint and discipline from the age of two years and upwards. Slates and pencils put into the hands of infants are surely the Devil's device. The near work given to such young children must prove destructive to the integrity of their sight; the spine also will suffer (I have already seen several instances), and the brain is more severely taxed by the motions of the hands and fingers, and by the attention to the instruction of the teachers than the uninstructed would imagine possible. Gentlemen, I confidently await your condemnation, and will pass on to other points.

As you are aware the method of instruction adopted in the primary public schools in these Colonies, as in Great Britain, is by means of Standards. This means that all the children attending public schools pass through exactly the same course of instruction and discipline. This is a complete innovation upon the system of education formerly adopted, is false in theory, and faulty in working, and ought to be abandoned in favour again of teaching by subjects.

Its defects weigh upon teachers as well as upon scholars, and prevent the State from getting the best results out of either the one or the other. The teacher of a Standard has to teach all the branches of an English education. It is perfectly well known, however, that teachers are seldom able to teach all subjects equally well. Some they have a perfect aversion to, and these are either taught perfunctorily, or, no matter what pains may be taken, with ill success. The children consequently suffer. and it is no uncommon thing for a child to pass well in several subjects and to fail in one or two, and thus be retarded in its studies for another year.

If teaching by subjects were adopted each teacher would be an expert, or as we would say, a specialist in his own department. Children would therefore have the benefit of the very best teaching that could be got in every department of their studies. In some branches this is all important. Writing, for example, will never be satisfactorily taught as long as children have to go under a series of teachers in this branch. No matter under what system teachers may have been taught, each one in writing will develop an individuality of his own, which will tend to confuse the style of a pupil, and retard his progress. Music, again, furnishes another appropriate example. Teachers are all expected to know something of the theory of music: if dowered with a good ear and voice it is a distinct advantage. Nevertheless, even the best dowered have very little success as teachers of music. There can, therefore, be no doubt that if music is a desirable branch of primary education—and who shall say it is not?—and if it is desirable from an æsthetic point of view that it should be widely and thoroughly cultivated, there can be no doubt I say that there should be a music master for every school. Then the effect of specialisation upon a teacher's health should be considered. The drudgery inseparable from the present system is very great and irksome, and trying to the health. It is impossible for a teacher to make a labour of love of every subject of instruction, and in the absence of that teaching becomes task work of the heaviest and dreariest kind. But let every teacher have that subject only to teach in which he excels, and for which he has quite special aptitudes, and he will go through a long day's work with interest, buoyancy, and delight. The scholars will not fail to catch something of their teacher's enthusiasm, which will have the effect of speedily evoking the scholars' own aptitudes. And, gentlemen, it is impossible to overrate the advantages to the individual and to the State that arise from the early recognition of one's true vocation in life. Le us now see how the Standard system affects the children themselves. More than adults even children have their aptitudes and aversions, some in a very marked degree. A child of an imaginative or reflective cast, and these qualities generally go together, is but seldom gifted with a quick or a retentive memory. These gifts, indeed, are mutually destructive. If the child is forced to cultivate the memory against the natural bent it can only be done at the expense of the higher and more valuable attributes, and the result too often is a maimed or stunted mind. How much better would it be to take the child away for a time from uncongenial pursuits, which are always hurtful to mind and body alike, and enable him to lay out his strength in the direction for which Nature has prepared him. Especially is this advisable when we remember that all parts of the brain are not developed *pari passu*, but some are of late development in some children and others in other children. Children who at ten years may be completely at sea over their grammar or arithmetic have been known at twelve or fourteen to develop quite exceptional powers in these branches. Let me entreat you, gentlemen, as opportunity offers to lend the weight of your influence in the direction of this much-needed reform in our public school education. The third and last point to which I shall claim your attention is the much-canvassed subject of female education, especially secondary and university. Practically this matter has been settled for the present on lines, as I believe, entirely opposed to the scientific opinion of the day. But though this is the fact it seems to me that we as physicians above all men should not too readily acquiesce in what we consider mischievous merely because it happens for the time being to be popular. In such a matter we ought to be the guides of public opinion, as we are the guardians of the public health, both mental and physical. The question on which we are entitled to pass an expert opinion is simply this. Does the differentiation of sex, as we see it in the higher animals, and especially in man, not by any means limited to a difference in reproduction, but accentuated by many minor or secondary differences in qualities of mind and body, argue and imply a differentiation of the functions of the mind and body? In other words, are the two sexes so differently constituted, designed by Nature for the fulfiment of the same purposes? If we are obliged, as the result of our knowledge and experience, to give a very decided and emphatic " No " in answer to this question, then it becomes our duty to give the present trend of higher female education our determined opposition, no matter how futile that opposition may seem.

It is not necessary for me to enter into details or prepare an elaborated argument before such a meeting as this, particularly as my views have become extensively known, both in New Zealand and in most other English-speaking countries. It is for you who are strangers here to express your opinions on this important question. But there is one practical point that I would wish to emphasise, and that is whatever our conclusion may be on the main question, it is our manifest duty to impress upon parents the necessity of giving their girls an interregnum from study and continuous labour of every kind during the time when womanhood is becoming established. Several months ago I was very pronounced in regard to this before an audience of women, and since then I am pleased to see that identical views have been enforced with his usual ability by Dr. Playfair.

INSANITY FROM ASSOCIATION, OR *FOLIE A DEUX.*

By H. C. McDouall, M.R.C.S. Eng., L.R.C.P. Lond.,

Member of Royal Society, New South Wales,

Senior Medical Officer Hospital for the Insane, Gladesville, New South Wales.

I have chosen this subject to bring before you because several very good examples of the affection have come under my notice lately, and also for the reason that the questions surrounding the causation of insanity are exciting an especial interest and attention throughout the civilized world at the present time.

Many titles have been proposed for the class of cases I propose to speak about. Of these *Folie à deux* is, perhaps, the best known; then we have Communicated Insanity, *Folie Imposé*, Induced, Dominating, Simultaneous, Transferred, and Reciprocal insanities. Of these *Folie à deux* though the best known and most used, is not entirely satisfactory, being too limiting, as occasionally more than two persons may be affected. Communicated Insanity implies too much, as one might infer from it that there was a contagion of insanity, as in the case of measles or scarlet fever, or at least that the chances of catching insanity were much greater than they really are. For, I trust, we may take it for granted that few will endorse the belief of Dr. Brunet, who wrote no longer ago than 1875, "that some kinds of insanity were very contagious, and there was in man such a tendency to imitation that no one can live continually with a madman without losing his own reason."

Folie Imposé, Induced Insanity, Dominating Insanity are all more or less characteristic of the disease as usually manifested, but hardly cover the whole ground. The other terms I have quoted, Simultaneous Insanity, Transferred Insanity, Reciprocal Insanity, are generally inadequate.

The term "Insanity from Association" appears to me to be preferable to any of the others, as it is sufficiently inclusive and implies just what we find to be the cause of these cases arising—namely, more or less prolonged and intimate association between two or more individuals, one of whom first develops insane ideas and is the active agent, the other or others playing only a passive part at first by countenancing these delusions, but may subsequently initiate new ones.

When we come to consider how it is that this transmission and adoption of insane ideas occurs, we are at once reminded of that tendency to think in the same groove which is frequently manifested by people intimately associated together: as a husband and wife, two brothers and sisters, or close and familiar friends. Sometimes in addition to similarity of mental outlook, manner, dress, &c., there is even an approximation of personal appearances in people not blood relations, so that one hears the expression of opinion that a long married couple are "growing like each other." This being so, it is not strange that if one of the intimately associated parties developes insane ideas the other should sometimes adopt the same ideas. The explanation of how it is that such delusions gradually become intensified, are added to, and finally cause a complete upsetting of reason, is much more difficult to find. The process of development is somewhat as follows:—Belief in the delusions of lunatics with whom they live is at first vague, confused, and intermittent; but it gradually becomes firmer and continuous. At last there appear genuine attacks of partial or general insanity, with not only complete belief in the reality of the imaginary persecutions of their neighbours, but in the transference of the same or similar persecutions to themselves, and this may result in an attack of acute mania with its most serious symptoms or chronic delusional insanity.

No doubt in many cases the "passive" agent recovers if removed from association with the "active" agent before chronicity has been established, but certain cases do occur in which there is no recovery, or only a partial one, and the mental faculties remain permanently impaired.

Arnaud considers that there are three factors common to all forms of induced insanity. These are: a similar predisposition; great and protracted intimacy ; and, lastly, a plausibility of the delusional notions. It is because of this last factor that most cases of insanity from association hitherto published belong to the class of persecutory insanities, and the cases that have come under my personal observation are also of this character. It is true that, as M. Régis affirms, no ideas are more communicable than those of religion and mysticism, and for this reason the mental disturbances they sometimes engender take most frequently an endemic or even epidemic form, and are often quoted as examples of *folie à deux;* still I do not think such cases should be classified with genuine cases of insanity from association, for this reason, they are not so much cases of real insanity as of a more or less transient delirium, the character not being profoundly modified, as it is in insanity, so that a cure is readily brought about by separating the subjects. In fact, these cases partake more of the nature of hysteria than of insanity.

In addition to these three factors of M. Arnaud, other writers, especially M. Règis, consider that this form of insanity happens only to those who are badly organised and who have already a proclivity to the disease. Dr. Ball considers that among other circumstances in the surroundings of the subjects which influence the occurrence of the outbreak the following are to be noted :—The frequently superior position of the "active" over the "passive" agent—*e.g.*, a master over his servant, or the better educated and more energetic brother or sister affects the other members of the family. The passive agents on the other hand are in general those easily influenced by their surroundings—the feeble-minded children, old people, and the effacés.

In the cases which I shall now bring before you there was, however, no hereditary predisposition so far as known, and no marked difference in mental calibre.

On 12th November, 1894, two brothers, Max and Julius Munk, committed simultaneous suicide in their bedroom at a hotel in Sydney by shooting themselves through the head with a revolver. Max, the elder, was about 32 years of age, and his brother a couple of years younger. Their previous history was that they were two young Germans, who had been in business in Sydney for a year or two as manufacturers' agents and skin and hide buyers. They were reputed to have been steady and industrious, but did not make friends, keeping to themselves, though they spoke English readily. Seven days before the date of the suicide, when engaging their double-bedded room at the hotel, they professed to be ill, and wanted their meals in their own room. They seemed very reticent—not inclined to give any information about themselves. At last Max said, "You know all about it ; I'm Max Munk. Someone has been persecuting us for our money." During their stay in the hotel they were of temperate habits, but seemed worried—especially Julius. The double suicide occurred about half-past three in the afternoon, and when the door was burst open their bodies were found ; the one seated in a chair, the other lying on the hearthrug in front of him, and grasping in his right hand a six-chambered revolver, two chambers of which had recently been discharged. On the floor was an envelope addressed in red and black inks to the city coroner, and containing the following note dated 22nd October, 1894—that is twenty-one days before the suicide :—

"Having been duped by buyers and packing firms combined, who, having been robbing me right and left, and who have been telling lies about Julius and myself and circulated the rumours all over the town, before remaining alive we rather die and let those base people have our lives on their conscience. My money—Union Bank about £600, Bank of Australasia £200—I leave, with all my belongings, to my dear mother at home (here follows her address in Germany).—Sydney, New South Wales, October 22, 1894.—MAX MUNK."

There was also in the envelope another communication in different handwriting and undated as follows :—

" We are both entirely innocent. The fact that we did not associate with other people has been taken advantage of by a conspiracy to interfere fraudulently with our shipments and at the same time to drug us. To conceal their own doings they spread the basest kind of rumours about us all over town. Thus we are quite helpless, two young inexperienced men alone in a foreign town with everyone against us, without friends, unable to get advice from anybody, our name made a by-word in town, a prey and victim to every charge made against us. Thus we are condemned and declared guilty without ever being heard, though entirely innocent and incapable of doing the least wrong, only victims of our inexperience and isolation. God help us.—MAX AND JULIUS MUNK."

Besides these two enclosures there was also a cheque dated 19th October, 1894, drawn on the Union Bank for £50, made payable to self or bearer, " Funeral expenses Julius and myself," and signed " Max Munk." So that the decision to commit a double suicide must have been come to at least as far back as 19th October, or twenty-four days before it was carried out.

From the evidence of these letters and the demeanour of the brothers at the hotel there is no doubt that they both suffered from persecutory insanity with hallucinations of hearing probably. As to which brother was the active and which the passive agent, I think it is pretty evident that the elder one Max was the instigator. Owing to their being foreigners it unfortunately was impossible to ascertain anything about their family history.

The next case of insanity from association which I have to bring before you seems to be a particularly good one as it occurs in a man and wife, and I have the records of their history for a fairly long period of time. Most of the cases hitherto published have been those of parent and child, of brothers, or of sisters, or brother and sister, in which blood relationship and heredity play important causative rôles.

Thomas L., aged 40, married, no children, a native of England, and a blacksmith by trade, was admitted to Gladesville Hospital on July 4, 1884, suffering from delusional melancholia. His previous history was that some time ago he attempted to drown himself by jumping out of a boat, being rescued with difficulty. Subsequently to this he made a determined attempt at suicide by cutting his throat, was treated and admitted to Grafton Hospital, and thence sent to the gaol on remand; but being allowed out on bail he shortly after left his home, and was found three days later at nightfall standing in a swamp in an extremely exhausted, and almost moribund, state. On resuscitation, he gave as a reason for his action that " he was trying to escape from people who were pursuing him in order to kill him."

The doctors who certified him subsequently stated that he was suffering from recurrent melancholia, with strongly marked suicidal tendencies and with delusions—*e.g.*, "that persons were conspiring to injure or kill him." He said he heard singing and other noises in the gaol all night long, which prevented his sleeping. In manner he was listless and morose, whereas he had formerly been of a cheerful disposition. During the fortnight he was under observation in the gaol he improved very much in both mental and bodily state, but still reluctantly admitted his delusions.

On admission to Gladesville he seemed a fairly intelligent man, though illiterate; was in poor health, and had a most miserable expression of face, indicative of great mental depression. His manner was reserved and retiring; he was attentive, and had no hesitation in answering questions relative to his mental condition. His memory was bad for both recent and remote events, especially the former. He suffered from extreme depression of spirits, believing that people whom he did not see would kill him. He had constant hallucinations of hearing at night, and sometimes during the day, all of a terrible nature; to free himself from this he was, he said, impelled to suicide.

He improved gradually in health and spirits, and remained in the hospital for about a year, when he was discharged to the care of his wife, who for some time had been clamorous in her requests for his removal, though he was still subject to hallucinations of hearing, and was occasionally extremely despondent. For some months after his discharge he continued to come to the hospital periodically, complaining of vivid and painful hallucinations of hearing which made life almost unbearable to him; but he continued to work hard at his trade, earning twelve shillings a day, though his nights were often sleepless. At this time he said the voices were in his left ear only.

Two years later he was again admitted to Gladesville by his own wish, as he found life outside insupportable from want of sleep, terrifying dreams, and general misery. During his stay in the hospital, which this time was less than six weeks, he seemed from the first more content and quickly improved, though never quite free from occasional vivid hallucinations of hearing ascribed to the one ear only.

He was again discharged to his wife's care, and from that day to this—a period of over eight years—he has managed to live outside the hospital, supporting himself and wife at his trade; but never long free from hallucinations of hearing and of general sensibility, which at times cause fits of depression, requiring treatment by small doses of opium before relief is obtained. He frequently writes letters to members of the medical staff explaining and reiterating his sufferings; and as these letters show his mental state very completely, I will quote extracts from some of the more recent ones.

"Dear Sir,—I can't suffer this state of things any longer. . . It is no use me trying any longer. It is might against right, so if it is not stopped on me and my wife I shall have to take other steps after this date. . . If there is anything happen here I shall hold the authorities responsible. I don't want blood at my door. . . It is hell on earth; death would be a happy release. . . After this date you keep on at your risk. . . I can't go in the garden, or sit down to meals, or work or do anything but what something comes down on me and makes me bad for days after. Why it would kill a horse; in fact, it is the whole cause of me and my wife's sickness. . . What is the matter with me, doctor, is a singing in the head, and this is just like steam blowing in my ear. When it is stopped I am well, and when it is blowing I am crooked. If Dr. Manning would drive these things away, keep me at my work, keep me from troubling him, no more blackmailing, no more tar, and things would go on smooth. . . It is something disgraceful. There is no drink and no crime, so we should have the benefit of the doubt. . . Well, doctor, do the best you can for me, and you can't do more.—Your old friend, TOM L.——"

This man's wife, Ann L., was admitted to Gladesville Hospital by her husband's request on ———, suffering from persecutory insanity.

For years she had been accompanying her husband on his trips to the hospital, and for long used to laugh and make fun of his delusions when he spoke of them, but it was noticed that she gradually adopted a different manner, spoke of the delusions as if there might be something in them, and of her husband as being a hardly used man.

Finally she developed ideas of personal persecution, and became so violent towards the neighbours and unfit for her work in the house that her husband had to have her certified and brought to Gladesville.

On admission she appeared to be an intelligent, fairly educated, and strong-minded woman in good general health. She was discursive in conversation, apt to interrupt her story by irrelevant matters with unnecessary detail and circumlocution. Her manner was nervous. She kept folding and creasing her apron while talking, and showed some quivering of facial muscles, but was temperate in language, did not use gestures, and when speaking of the bad language used by her persecutors excused herself from repeating the exact words. To show her state of mind I will give her story in her own words.

"I am forty-eight years of age and have been married to Tom twenty-six years. We have no children, and I have always had fair health previous to these troubles, excepting for an attack of rheumatic fever twenty years ago. About four years ago I had an attack of what the doctor said was influenza and bronchitis, but I ascribe it to the influence of some people who had, and still have, designs on my life. After this I noticed people following me about, dogging my footsteps and talking about me. Some of the things said were—'That's not her,' and 'Be careful, her eyes are quick, she'll have you.' I was so annoyed by these and other things that in August, 1893, without telling my husband the real reason, I persuaded him to take a house in another locality, but shortly after we moved in annoyances began with neighbours who made queer remarks to me, and were always hammering at woodwork, pulling down and rebuilding a wash house and the dividing fence between us on purpose to annoy me. After this I was sitting one evening in the kitchen and my husband was lying down in the front room when all of a sudden I felt violent shocks. I thought the back would fall out of the grate the room shook so, and at the same time I perceived a sulphurous smell, such as sometimes occurs when drawing cinders, pervade the room. At the same time I noticed my cat, dog, and parrot in commotion, and I was kept running from one to the other of them trying to pacify them. Just then my husband entered and asked what was the matter and remarked on the queer smell in the room. I told him to keep quiet and say nothing and we would see what would happen. That night I was so upset that I had to have the doctor in, and I spent the night sitting on the bed and holding on to a towel tied to the end of it, being in such convulsive agony that I felt I would have died had I lain down. In this attack, and in similar but less severe ones which have followed it, I felt a deadly cold sensation in my limbs, and had to keep my bed for days after because of the great shock to the system. From this onwards I was continually subjected to annoyances by these people. Sometimes at night I heard the end of the house cracking as if they were trying to beat it in. At other times I felt a sudden sensation in my temple or behind my left ear as if a knitting needle were being driven in, and I could often see the mark left which was just like that caused by a tick bite. Again at times they threw something on me which tasted in my mouth like cayenne pepper. I often also smelt poisonous emanations which they caused, and I have seen flashes of brightness like lightning coming through the window, and on examining the blind found it riddled with holes. I have often seen the people who cause these annoyances, but find it hard to identify them, as they frequently change; the instigators of these persecutions being wary enough to employ others, sometimes even little children, to carry out their cruel orders. At first when I felt these annoyances I thought they must be caused by animals. as I did not believe Christians could be so cruel and diabolical. They have even gone so far as to poison the water-closets, and have dared to follow me and my husband on the public trams, where I have pointed them out to him and warned him to keep his eyes open. The reason I think that the next door neighbour is at the bottom of the persecutions is that the former occupant of the house he lives in wanted to sell me a small table, and as I would not buy it I think he told his successor in the tenancy to annoy us."

After admission to the hospital she did not sleep well at night, only getting about four hours' rest, and was at times very noisy. She had a room to herself, and would barricade the door when she entered it, and then commence talking to herself or to her imaginary persecutors. She seemed to be suspicious of some of the nurses, and said they were too free with the "breeze," explaining that she knew what that was as she had experienced it outside.

After some months in the hospital she had improved a good deal in manner and behaviour, and appeared to be less troubled with hallucinations, so was allowed home on leave of absence, but did not stay out long, as her husband got nervous about her and brought her back. She remains in the hospital yet, and seems now to associate her husband with her tormentors, refusing to see him when he calls.

Here we have a case of the intimate and somewhat exclusive association of an intelligent woman, presumably originally quite sane, with her insane husband—the subject of vivid hallucinations of hearing and general sensibility—for about eight years, resulting in a gradual growth of suspicion in her mind against her neighbours, and the blaming of an illness on to them—this illness itself being especially likely to upset the nervous centres,—and from this onward the development of perverted sense-perceptions of increasing intensity, till there has resulted a condition of absolute insanity with inability to recognise the ordinarily evident relations of cause and effect even while her general intelligence is practically unimpaired.

As regards the question of communicability of delusions among the insane, I may say that I only observed one case of the adoption of the insane ideas of one patient by another during the last four years in Gladesville Hospital, and in this the adoption was not a complete or permanent one. There is, however, I believe, a case in the Parramatta Hospital for the Insane of two women patients associated in one ward who have the same delusion, and one of them has undoubtedly acquired it from the other. Such cases occurring within the walls of an hospital for the insane are so rare, however, that we need hardly consider them, though no doubt Dr. Brunet is correct in his observation that sometimes patients suffering from maniacal excitement with well marked delirium imbibe, at the commencement of their convalescence, ideas of persecution from other patients having such delusions. However, the effect produced is really only to cause them to be generally suspicious and doubt the *bona fides* of their attendants or friends, and one does not observe the adoption of the actual delusions of any particular patient.

In conclusion, I think that from the accumulated knowledge of this affection we may justly conclude that the danger of acquiring insanity from an insane person is, to persons not obviously predisposed, very remote; but that as such cases have occurred, it is inadvisable that anyone should have too long and too exclusive an association with an insane person having marked delusions. More especially is this the case with sympathetic and impressionable persons, even if of sound mental organisation. For this reason I consider that the association of children with the insane, such as occurs when so-called "tame patients" are employed about the officers' quarters, is theoretically undesirable. For though no immediate bad effects may be perceived, yet children have retentive memories for peculiarities, and in after life may recall and harp on old ideas communicated by insane associates of childhood, at a time when perhaps from ill-health, worries, &c., a seed bed for mental alienation has been prepared.

DEATH CERTIFICATION AND REGISTRATION IN NEW SOUTH WALES.

By George Lane Mullins, M.A., M.D., Trin. Coll. Dublin, &c.

Honorary Physician to the Hospice for the Dying; President of the Eastern Suburbs Medical Association of Sydney; Late Assistant Physician to St. Vincent's Hospital, Sydney.

"No one, I presume," says Sir Henry Thompson, "will deny that it is one of the first duties of the state to obtain satisfactory evidence as to the fact and as to the cause of death, whenever it occurs to any one of its citizens, without exception, whatever the class of society to which the individual belongs."

Deaths are registered in New South Wales under the provisions of an Act of Parliament passed in 1855, over forty years ago. Section 21 of this act (19 Victoria, No. 24) provides that "In each case of the death of any person the tenant of the house or place shall, within thirty days next thereafter, inform the district registrar of such death, and of all particulars concerning the same according to the forms of registration hereinbefore referred to."

Deaths are registered for various reasons, the principal of which are: (1) For statistical purpóses; (2) To enable the authorities to know whether any preventable disease is on the increase; and (3) To guard against secret crime, such as murder, criminal neglect, &c. Taking these three reasons seriatim we may consider how far the objects may be attained as the law stands at present.

1. With regard to the value of statistical returns. Under the present law no certificate of death is required from a duly qualified medical practitioner, or, indeed, from any person, as to the cause of death, and, although registrars usually demand one from some person, there can be no doubt that in doing so they are acting illegally.

In his evidence before the select committee on the registration of births, deaths, and marriages, appointed by the Legislative Council in 1886, Mr. E. G. Ward, the then Registrar-General, stated that if a medical certificate of the cause of death were not produced when the fact of the death was registered, there were no means by which the registrar might ascertain whether death had arisen from natural causes, except from the information afforded by the person registering the death, even if such person were a man of bad character. He stated further that about ten per cent. of the deaths were registered without a medical certificate being furnished. Before the same committee Dr. R. D. Ward, who had acted as registrar for the district of St. Leonard's for thirty years, stated that the statistics were very unreliable so far as the cause of death was concerned. At the same time Dr. Ashburton Thompson suggested that all deaths should be registered in two classes—certified and non-certified.

In the report of the committee, dated 21st October, 1886, we find the following words:—"We are of opinion that in all cases where a legally-qualified practitioner has been in professional attendance on a deceased person, it should be his duty to furnish a certificate of the cause of death; and that in those cases in which no legally-qualified medical practitioner has been in attendance upon a deceased person within a reasonable time preceding the death of such person, it should be reported to the officer in charge of police in the district in which the death occurred, who should thereupon make due inquiry; and if he is satisfied that no suspicious circumstances existed in relation to such death should give a certificate that, having so inquired, he found no reason to doubt that death was due to natural causes. . . We are of opinion that the correct compilation of vital statistics and their prompt transmission to the health authorities is highly important."

For statistical purposes, therefore, it is abundantly evident that the Act is a failure.

2. To enable the authorities to ascertain whether any preventable disease is on the increase, and to guard against such increase. To a certain extent the Registration Act helps us to do this, but the great drawback is that deaths need not be registered until nearly a month after the event has happened, and it is then too late to prevent the spread of disease. Supposing, for instance, a death from diphtheria occurs on 1st January, the fact need not be notified to the registrar until 30th January, and in the meantime the whole district may have been infected. Thirty days is far too long an interval. It is as easy to register a death within seven days as within a month, at any rate when the death occurs at not too great a distance from the registrar's office.

Then again, the boundaries of the registration districts are those of the parliamentary electorates, and not of the boroughs or municipal districts. Until the year 1894 there was a registration district for every borough in the metropolitan area, but with the new Electoral Act all this was changed, and it now happens that deaths taking place in one suburb are often credited to another. For instance, deaths occurring in the City, or in Paddington, or in Waverley, must, under certain circumstances, be registered in Randwick, and a similar state of affairs may be observed in the other suburbs. Now, in the case mentioned, in order to obtain information as to the causes of death in their respective districts, the municipalities of Sydney, Paddington, and Waverley, must obtain their statistics from various sources. Again, although the municipal district of Randwick may be entirely free from preventable disease, it may be forced to acknowledge a number of deaths from such diseases, such as typhoid fever, diphtheria, &c., and yet have no means of defending itself.

3. As a safeguard against secret crime, such as murder, criminal neglect, &c., I fear the Act is a total failure. A medical certificate is not of the "fact" of death, but of the "cause" of death. The wording of the medical certificate in use is open to exception, as it is quite evident that the medical attendant is not expected to view the body, and so verify the fact of death having occurred. It is quite possible to obtain a medical certificate fraudulently from a medical man, who signs the document in good faith. A medical practitioner may have under his care a patient who is seriously ill. He sees the patient in the evening, and says he will call again the next morning. The patient's friends wish him out of the way, murder him during the night, and going to the medical attendant in the morning, say that the sick man is dead. The doctor, knowing the serious condition of the previous day, gives a certificate on which the cause of death is registered, and the body is buried. Murder will not out in all cases.

In a second case, a patient may be dangerously ill, and without the knowledge of the medical attendant another medical man is called in to the patient, who is now under an assumed name, and is removed to other premises. The patient recovers, but the friends goes to the first attendant and say the man is dead and obtain a certificate. The undertaker seeing the medical certificate sends the coffin of the required size. This coffin is filled with stones and buried. Here the medical certificate is produced when the death is registered, the undertaker certifies in good faith that he has buried the body, and the clergyman reads the service. The patient's friends claim the insurance money which they divide in a foreign country.

The medical certificate should be a certificate of the "fact" as well as of the "cause" of death.

I would suggest the following form:—

"I hereby certify that I attended.......................................during h......last illness; that h......age was stated to be ... ; that I last saw h...... alive on the............day of............189... ; that I viewed h......dead body on the............day of............189... ; and that to the best of my knowledge and belief ...he died on the............day of............189..., at............ ; and that the cause of h......death was as hereunder written."

(Here follow the usual particulars.)

ON THE QUESTION OF FINGER MARKS AND FOOTPRINTS IN MEDICO-LEGAL INVESTIGATION.

By Harry A. de Lautour, Oamaru.

In July, 1892, during an inquest on the body of a woman who had been found buried in a creek, with the throat slightly cut in two or three places, a severe bruise on the left side of the head, and other marks of violence, my attention was attracted to finger and thumb prints on the handle and blade of a blood stained razor. The razor was the one no doubt with which the woman's throat had been cut. The nature of the wounds were such that it was quite possible that they might have been self inflicted. I had previously seen suicidal razors, but I had never noticed finger prints on them before. I made some experiments, with the result that I found when the blood was quite fresh and fluid the thumb gave a smear. The grain of the thumb did not come out distinct as in the razor found in connection with the above case. I further found that in order to get the grain it was necessary to wait some time until the blood began to dry and coagulate. The *modus operandi* for experiment was while the blood was fresh and fluid to let the blade slip lightly through the fingers, when you get a smeared print, and then wait till the blood began to dry, it would then take a good impression of the grain.

I have since that time seen several cases of suicidal cut throat, and carefully examined the razors, but in no case have I found any finger prints; in some I have found a smeared appearance. I may in passing say that the thumb and finger prints did not correspond with the thumbs or fingers of the deceased woman, or of the man who was arrested on suspicion of having murdered her.

From my observations I am inclined to think that in cases of cut throat, where the weapon is found blood stained and with clear distinct finger or thumb prints, it would be fair to infer the presence of some other person at or shortly after the fatal event, and it would, in the absence of explanation, be indicative of homicide rather than suicide.

In April, 1877, I was called by the police to assist in identifying a burglar. He had entered a shop through the skylight, and in so doing he had trodden with naked foot on—firstly, dusty shelves; secondly, on to a piece of clean white blotting paper which happened to be lying on the desk in the office, leaving on the paper a clear imprint of his naked foot. For certain reasons the police inferred that he had accomplices. The stolen goods were found in various places, and three men were arrested on suspicion. Beyond the print on the blotting paper there was nothing to connect any of the men with the crime. And the print was daily getting fainter. It was at this juncture I was called in. I suggested that the print should be fixed before it had faded away, this was done by floating the paper on gum so that the gum should penetrate up through the paper and fix the dust, thereby setting the foot print. In case of accidents, when dry this set dust print was photographed. The next thing was to find out which, if either, of the prisoners was the owner of this big flat foot. This was done by painting the floor of the passage leading from the bath room to the dressing room with a solution of thin printers' ink for a few feet, and the remainder of the passage was lined with white paper. This was done while each separate prisoner was in the bath; on coming out to dress he left excellent footprints behind him. It was most easy to find the print which coincided with the dust print. On being confronted with these prints the big burglar confessed his guilt, and gave evidence against his companions.

I have prepared dustprints for your inspection, and also prints to compare with them, and also outlines of different feet to compare with them. Impressions of feet on dusty floors, and of dusty feet on clean floors can be obtained in much the same way.

The best plan is to carefully place a piece of dry clean blotting paper over the dusty foot mark, then lay on this a damp cloth, cover this with a smooth board and a heavy weight; allow this to remain some minutes, then remove the weight, &c., very carefully, after the blotting paper is dry set with gum as before, and test your outlines. I do not say that all your impressions will be good ones, but with care you can get some quite sufficient for your purpose.

SECTION OF MIDWIFERY AND DISEASES OF WOMEN.

PRESIDENT'S ADDRESS.

By E. W. Way, M.B., L.R.C.P., M.R.C.S.,

Lecturer on Diseases of Women, University of Adelaide.

Gentlemen,—

Allow me to express my sense of the great honour I feel in being called upon to preside over this important section of the Fourth Australasian Medical Congress. I am not unconscious of my shortcomings and unworthiness to fill this high position, but I am strengthened by the knowledge that I can freely count not only upon the kind and generous sympathy of my co-workers assembled to-day, but also upon their wiser judgment and more mature experience.

Looking back over the past few years, one is filled with wonder and amazement at the astonishing progress made in every branch of science. To whatever division we turn we see the same activity, the same spirited rivalry and competition, and the same wonderful march forwards; and in this respect our great twin art and science of medicine and surgery, with all its branches, has in no way lagged behind. Everywhere is observed the same vitality, the same eager search after truth and knowledge. And in medicine and surgery no more remarkable growth, no more brilliant progress, is presented than that shown by its great branches of obstetrics and gynecology. That the latter should have apparently outstripped its sister is due to the fact that gynecology may be said to have reached its present proportions during our own lifetime and experience, while the science and art of midwifery has been the growth of centuries, and had reached a perfection and exactness altogether remarkable in the times when medicine and surgery had progressed so slowly.

A glance at the literature of half a century will bear me out. Take as an instance an important work in those days, Gooch's "Account of Some of the More Important Diseases Peculiar to Women," published in 1831. It contains chapters on peritoneal fevers and other obstetric subjects, diseases of children, and essays on the Plague and insanity. The only subjects discussed at length on matters suggested by the title are polypus uteri, which has a lengthy description, and irritable uterus, a subject which has now set below the horizon of our present beliefs. Contrast this scant notice of gynecological subjects with the literature of the present day, with its volumes and journals, its enormous and ever-increasing text books, whose multiplicity is becoming almost a curse to the man who desires to keep himself abreast of the times, and we cannot fail to recognise the intense interest everywhere awakened by the developments of the day, and to see how our knowledge and power over disease has expanded to limits to which we can at present see no end.

In glancing at the investigations and discoveries of Science generally, it is a curious spectacle to observe how she is on the one hand striving to invent and perfect means by which human life may be destroyed and suffering induced; and on the other, struggling after more perfect knowledge by which human life may be saved and suffering averted. While active in the discovery of new explosives and inventing new weapons and engines of war, Science has at the same time been busy in bringing to light new conceptions to improve the conditions of life and health, to avert disease, to mitigate suffering, and to save life. Medicine and surgery have eagerly grasped the great truths wrought out by the discoveries of Pasteur and Lister—whose life work will give them an enduring place amongst the Immortals—and applied them to their art and practice. The new wealth opened up by those great master minds has led others to enthusiastically follow up the lines on which their inquiries and investigations lay, and we now understand the important influence upon life and upon our surgical work exercised by the unseen enemies of man. The various forms of micro-organisms have been differentiated: their nature, habits, and means of multiplication worked out; as well as the measures to prevent their invasion, or to cut off their supplies should they effect a footing upon our shores. Although bacteriology may be said to be still in its infancy, and although its work must necessarily be of an incomplete and imperfect character, yet discovery has followed discovery, new facts have been brought to light, improved methods of research introduced with such rapidity, that it has already accomplished wonders; and we begin to feel that we are not altogether indulging in foolish dreams or Utopian ideas in looking forward to the time when contagious and infectious diseases may be banished from our midst.

A recent writer on public health remarks: "The theory of a living contagion has been so thoroughly investigated within a score of years as to yield a science of bacteriology which has shown us the nature and the position of the foe, and has made possible an organised defence. That defence simply is cleanliness—national cleanliness. The microbe is the particular enemy of mankind, and it thrives in filth; when cleanliness is observed the microbe disappears." The old maxim, that "cleanliness is next to godliness," comes back to us with all the force of an established scientific truth. Like many great truths its simplicity is a bar to universal acceptance and belief; and yet to the application of this simple law is due most of the remarkable and wonderful achievements of modern obstetric and gynecological work. Let me call to your memory how the expulsion of puerperal fevers from the great lying-in hospitals of the Old World, and America, too, followed the introducton of strict antiseptic midwifery, the principles of which are based upon this simple truth, a fact which leads us to deplore its want of application in the general routine of private practice. Do not statistics show, does not experience prove, that whereas the mortality has been enormously lessened, and deaths from septicæmia practically abolished in these institutions, that no such striking improvement is noticeable in the great mass of midwifery attended in private houses; that, indeed, the life of a woman is now safer in the hospital than in her own home with all its surrounding comforts and advantages. One cannot but feel that we have lagged behind in this one respect—that it is within our power to do much more to help our suffering sisters in this great trial of life, to surround them and guard them from attack, so that we may remove from them this great danger, this plague, this "perpetual epidemic"; to use the words of our late great master, Matthews Duncan, "this never-ceasing destroyer of lives, the most valuable, the most loved in the community." But our experience in gynecology teaches us that our cleanliness must be complete and thorough. It admits of no half measures. To be *clean* is to be clean absolutely. No dirt, whether living or dead, is permissable. No one doubts the truth of it, no one disputes it, and yet how little or how perfunctorily is it followed out in the general routine of ordinary obstetric work. Not altogether is the doctor to be blamed. To the ignorance of the laity is due much of the laxity of our provisions. We often find ourselves struggling vainly against the stream of ignorance and prejudice. But I conceive our true position is this, that it is only when we deal with a woman in labour as with an important case of surgical operation, with a special tendency to septic troubles, that we can be certain of our results. The important factors in the transfer of infection in all cases are—first, the patient; second, the doctor; third, the nurse; and fourth, the surroundings. In any important operation involving the life of a patient, no surgeon would feel justified in proceeding, unless he were assured of his position in regard to these points. He is the commanding officer who is responsible for his subordinates, his arms, and his commissariat. And it is only when we can get the rank and file of the profession to recognise to the fullest extent their personal responsibility in this respect, that we shall hope to attain the same beneficent results in midwifery that have cast so brilliant a lustre upon the work of its twin sister, gynecology.

But ought we not to go a step further and teach the need on the score of health and life—if comfort be disregarded—of the exercise of personal cleanliness in the individual? Is it not the experience of every gynecological surgeon—especially those connected with hospitals, through whose hands large numbers of women pass, and whose opportunities of observation are therefore great—that personal cleanliness is quite the exception. Is it not a false modesty that allows our children to grow up ignorant of the special need of cleansing attentions to the external sexual organs. It is not a pleasant subject to discuss, and I should refrain but for my knowledge that it is a constant experience to find inflammatory troubles, the result of the propagation of micro-organisms which have found a suitable breeding ground in the unremoved secretions of the parts which, like the perspiration and dirt of the face, could be removed by a more liberal use of soap and water. It is not always easy to trace the origin of puerperal fever, but observations such as now noticed lead us to surmise how easily certain so-called cases of auto-genetic infection may arise from neglect of simple hygienic rules.

Assisted by the new light that bacteriology has thrown upon the origin of septic disease, gynecology has made the most striking and wonderful advances. Nor has the advance been confined to its own limits, for it has opened the whole abdominal cavity to the resources of the surgeon. The surgery of the liver, of the kidneys, of the stomach and intestines, of the bladder and peritoneum, has practically followed in the wake of the gynecological surgeon, so that a new era of operative work has arisen, the brilliance of which has fairly astonished and bewildered, not only the laity, but the profession itself. Operations and new modifications and improved methods have followed one another with such rapidity that our best text books speedily become antiquated, and new and frequent editions and new works have to be issued to keep up with the spirit and progress of the times.

It is not to be wondered that in some minds, and especially in those of men who have had little, if any, opportunity of witnessing or taking part in this new advance, a doubt should have arisen as to the necessity of many procedures, and of much of the practice that is being carried out with such eager enthusiasm. Much controversy has arisen as to the utility and the moral right of performing many of the present operations, some of which appear to be of a bold and daring character. Opposition and criticism of this character are often the outcome of ignorance and inexperience. Let me mention as an instance the case of a lady upon whom I have recently operated —the wife of a medical man—for a Parovarian cyst matted down by dense adhesions. A few years ago I recommended a curetting for endometritis, and suggested the possible need at some time of an abdominal section. My advice was contemptuously and scornfully rejected by the husband—recently arrived from the great centres of medical thought—who expressed his absolute disbelief in all such operations, and mouthed for himself the consensus of medical opinion as being adverse to such proceedings. What could one do but smile at the cock-sure ignorance displayed, which is now borne out by a letter received the other day in which, urging as an apology for making certain inquiries as to his wife, he stated that he knew nothing about such cases, as he had never witnessed an abdominal section in his life. This is an example of the attitude assumed by many of our critics, who, placing themselves upon a high level of self-conceit and ignorance, boldly cast doubts upon the need and character of the work of those who devote time and patient study to these serious and important questions, and who—speaking for those I have met—never undertake an important operation without the fullest anxiety springing from the sense of responsibility resting upon them.

In the evolution of pelvic surgery, changes of opinion and changes of practice based upon greater experience, wider pathological knowledge and increased diagnostic facilities, must of necessity arise, and many questions remain unsettled. There is, however, a growing tendency amongst gynecologists to be conservative and to spare organs that are not permanently and hopelessly damaged and functionally useless. They are more chary in recommending operations on women of nervous type, unless the complaint is obviously one of "coarse" disease, and not a functional or transient disorder. Thus, most of our pelvo-abdominal operations are now of a more serious character, because they are chiefly those associated with pus in abdomen or pelvis, or are the direct or indirect result of inflammatory disease, which imposes special difficulties, and adds danger to such work.

I will not stay now to discuss the propriety of operating in ovarian or fibroid tumours, or to repeat to you the oft-told tale of the triumphs and achievements of ovariotomy or hysterectomy in these cases, or dwell upon that terrible disease which every woman dreads with so much anxiety, cancer of the womb, or the need of its early recognition to ensure successful removal.

These diseases, frequently as they are found, form but a small proportion of those for whom we are called upon to provide relief or cure by operation. The great preponderance of those who consult us are suffering from pelvic inflammation. Their condition often destroys the very pleasure of existence, and is even a menace to life itself. It is the newer pathology which has been evolved during the past few years from the operations of gynecological surgeons which has so far placed the stamp of authoritative approval upon the operative treatment of these cases. We now know that in almost every case of pelvic inflammation, we can trace its course, first from the uterus, or perhaps vagina, along its mucous surface into the fallopian tube, and thence into the peritoneum. We see how it destroys tissue and invades the substance of organs in the course of its progress. We now recognise that the salpingitis, ovaritis, peritonitis, hydrosalpinx, haemato-salpinx, pyo-salpinx, ovarian abscess, exudations, adhesions, and some intestinal complications are all the result of one diseased process, springing almost invariably from a septic cause, which is usually puerperal, but not uncommonly specific in its origin, the varied conditions present being due to difference in intensity or character of the poison or of the organs chiefly attacked. Strange though it may appear, all this was recognised and graphically described in the classic work of Bernutz and Goupil, more than thirty years ago, but their views were not accepted, and were at last forgotten, until Lawson Tait revived and brought them into prominence in his writings based upon his remarkable surgical experience. Now, however, thanks to Tait and his co-workers, the old dictum which ascribed most of these troubles to pelvic cellulitis is overthrown. No longer we talk of periuterine phlegmon, perimetritis, parametritis, and a dozen other diseases. The origin of pelvic abscess is now understood, and proved over and over again to be a synonymous word for pus in the tubes. It is known that it but rarely springs from pelvic cellulitis, and that pelvic cellulitis itself but seldom exists excepting as a part of a general inflammatory process, involving first its adjacent structure, the peritoneum. It is in this class of case in the field of pelvic surgery that we are in strong accord as to the necessity of surgical measures. Gone with the old pathology of pelvic cellulitis is the do-nothing dilettante treatment by rest, general improvement of the system, and local applications. The presence of pus, the destruction of tissues, the constantly recurring peritonitis, the persistent suffering, and the probability of complications leading to death, are regarded as a sufficient justification, and indeed an imperative obligation, for surgical interference. It is often argued that to remove the internal organs of generation unsexes the woman, causes sterility, destroys sexual feeling, and changes the woman's whole nature. One can understand arguments of this kind applied to cases in which healthy ovaries and tubes were removed, though even here I doubt if the supposed results are not greatly exaggerated. But when their tissues are already destroyed beyond redemption, and when function is obliterated or perverted, these arguments surely are not of much weight. The woman is already unsexed (as much as surgery can unsex her) by the results of disease ; the sterility exists, the sexual feeling is either obliterated or approach impossible, and the woman's whole condition is one passing (if she has not already passed) into one of hopeless invalidism.

Much criticism has arisen, even amongst our own ranks, upon the suggestion advanced and acted upon chiefly by the French school. Not content with the removal of the tubes and ovaries in pelvic abscess, it is urged that extirpation of the womb also is necessary in many cases to make the cure complete. At first sight it seems a bold and unnecessary proceeding, but the results, so far as they appear, seem to justify this extreme step, and much can be said in favour of it. It is argued that the uterus should be removed, because it is no longer of use, and is devoid of physiological function; that it is no longer innocuous, but being diseased is, on the contrary, a remaining source of danger; that as the tubes may be regarded only as a prolongation of the uterus, it is idle to expect that when disease begins and exists in the uterus that it can be cured by the removal of the more remote parts affected. It is also further urged that not only does it involve no increased danger to the woman, but that the operation actually diminishes the mortality, at any rate in the hands of those accustomed to the performance of vaginal hysterectomy. I have had no personal experience on this question, and at present am content to await developments and the reports of the further progress of these cases.

We have by no means arrived at perfection in our work in these cases. Remarkable as have been our numerous successes, we can but admit the occasional failure to absolutely cure, even if the life has been saved. At times patients present after-symptoms which are distressing to themselves and disappointing to the surgeon. If this new method will help us in these cases of persistent pain and discomfort, which at times continue in spite of our efforts; if the avoidance of ventral hernia, of intestinal and other complications can be relied upon, which is now promised by its advocates, with a lessened mortality, then I feel that a distinct progress will be made in the operative treatment of pelvic disease.

If I were asked to point to one of the chief evidences of progress in our art I should name the recognition and treatment of ectopic gestation. I need not quote statistics to show how much more frequently this freak of nature occurs than was formerly supposed. Our improved knowledge of its pathology and of its signs and symptoms have enabled us to discover and cure cases that but recently would have died with the condition unrecognised. To Tait must be given the praise of having first with boldness and great skill —for which he has ever been distinguished—cut down and secured the bleeding vessels of a ruptured sac, and for having thus established the only truly scientific and effective method of dealing with this almost certainly fatal condition. The diagnosis and successful treatment of these cases in the early stage is no longer a matter of great difficulty; but, unfortunately, our advice is seldom sought until critical and dangerous complications occur. The patient may or may not think herself pregnant—in either case she sees no need to consult her doctor, much less to undergo a vaginal examination, unless some striking occurrence warns her of some possible danger.

The diagnosis being made, there can be no doubt that surgical treatment is the only reliable one to adopt. Doubts may exist as to when to operate, but we must always remember that the patient is on the brink of a precipice, that danger awaits her at every turn, and that a calamity may happen at any moment. Werth is undoubtedly right when he urges us to regard ectopic gestation in the light of a malignant growth requiring early removal from the patient, since hæmorrhage, with all its risks and dangers, confront her in the early stages, while in the later months she has additional and increased risks of peritonitis and septicæmia.

The question of the treatment of uterine fibroids is a very large one, and it would be impossible to deal with it in this rapid survey of gynecological surgery. One is met with the varying conditions of this disease, sometimes calling for surgical interference, at others for abstention. Being of a benign nature, it is only when discomfort is present or danger is threatening that we are called upon to employ surgical measures. It may be that pressure or bleeding or enormous and rapid growth is the condition which causes the patient to seek advice. Often these tumours exist, as is well known, without producing discomfort, and many disappear altogether, chiefly at the menopause. But when surgical relief is found necessary, we have to be guided by the special circumstances associated with the case as to the course to adopt, whether to be content with a double oophorectomy (results from which I have found very satisfactory) or whether we remove the tumour alone, or with part or the whole of the uterus. No absolute lines can be laid down, but whatever plan we follow we have the satisfaction of knowing that modern gynecological work affords ample proof to warrant the necessity of the step. Serious and formidable as some of these operations are, and anxious and responsible as we must feel in undertaking the work, we can now so fence round our patient with safeguards as to render possible and comparatively safe an operation which a few years back would have been considered a reckless impossibility. No more encouraging page exists in the annals of modern surgery than the record of the patient, modest, but no less brilliant, work of that gynecological surgeon, Thomas Keith, whose death we have only recently had to deplore. He did perhaps more than any other man of his time to place the major operation of hysterectomy on a sound and safe footing. The endorsement of this great master of the teachings of Apostoli gave a great impetus to the application of electricity in the treatment of these tumours, but although high expectations were raised and the most glowing results predicted and even recorded, this form of treatment has not sustained the high position so confidently expected for it. As one who has followed it very closely, encouraged by high hopes and belief in its usefulness, I may say I have now practically abandoned it. My results disappointed my expectations, and I have further felt that it is not only difficult of application in many cases, but that the patience of the sufferer is often wearied at the length of time and expense of the treatment.

In plastic surgery a wonderful amount of work, much of it new, has been done of late. In this subject I would include not only the operations for the repair of lacerations of the pelvic organs, but also those for the correction of displacements of the uterus and its appendages. In the restoration of the perineum few surgeons now perform the old denuding operation with its numerous modifications and ingenious devices. The more modern flap-splitting measure is one that gives most practical and effective relief. No one is called upon to justify operative treatment in these cases, the discomfort and suffering is often great, the relief immediate and permanent.

New methods of treating displacements of the womb by operation have been introduced of late years, more especially displacements backwards and downwards.

In retroversion no one for a moment considers these measures necessary, excepting in cases where pain and disturbed function render the life of a patient miserable, and unless it can not be cured by simple measures. The failure, however, of the mechanical treatment to cure the discomforts and frequent dangers from the use of pessaries have led to the adoption of means by which the organ after being replaced can be maintained in its normal position. The three principal methods are those known as the Alexander-Adams (shortening the round ligaments), ventro-fixation of the uterus, and vaginal fixation of the uterus. I have had considerable experience in the first two methods, but my knowledge of the last is confined to some half dozen cases; but I have seen enough to convince me that there is much to recommend and to approve in it. I have followed the plan of Duhrssen, who claims for it amongst other advantages that it is less dangerous, that the possibility of ventro-hernia is done away with, as well as the risks of adhesion of the omentum to the abdominal incision and of Ileus also. Further, it is urged the convalescence is shorter. I am inclined myself to think this operation will supersede the others at present in vogue.

And now, gentlemen, having travelled hastily over some of the most important questions exercising our minds, I may remark that I have left to individual members the task—or pleasure it may be—of dealing critically and exhaustively with each particular subject. My own retrospect has been a most imperfect, incomplete one, but I have said enough in praise of what has been done in the past to inspire us with higher hopes for the future. Almost all our progress has been due to the adoption of the strict principles of antiseptics or asepsis. The use of anæthetics has been of vast benefit in not only enabling us to perform operations that would be otherwise impossible, but in helping us to a correct diagnosis, without which an operation is likely to be a failure. To Lister's great conception is due the security and safety with which we can now attack disease with every hope of success.

It remains for us to sustain the high standard of work that has already been reached, and to carry it forward on proper lines, not for our own glorification, not for our personal emolument, not influenced by the baser motives that urge men on in political life, but guided solely by higher feelings and desires—the good of suffering woman, the relief of pain, the saving of life, and the restoration to her of health and usefulness.

We can only hope for complete success and the satisfaction that springs from it when we fully recognise that our work must be thorough and exact. Not only must we exercise the utmost care and patience in arriving at a correct diagnosis; but if the case suggests the necessity of an operation, we must be honest and right, "doing unto others as as we would have them do unto us."

Dr. Hocken expressed the regret that all must feel at the unavoidable absence of Dr. Way, of Adelaide, the President-Elect. A letter received from Dr. Way a few days before expressed that gentleman's great disappointment in not being able to take part in the proceedings, which he trusted would be of the most valuable and successful character. Dr. Hocken then proposed that Dr. Ralph Worrall, of Sydney, one of the Vice-Presidents, preside over the meetings of the Section. Dr. Worrall, it was needless to say, held an eminent position amongst his Australasian brethren, especially in that department of his profession to which he had devoted himself.

Dr. Garland seconded the proposition, which was carried unanimously.

On behalf of Dr. Townend, of Christchurch, Dr. Syme exhibited a new design of clamp for securing the broad ligaments in vaginal hysterectomy. The instrument consisted of two flat, parallel, steel bars, 9 inches long, loosely fitting together at top and bottom by means of a slot and pin. A lateral screw nut tightens them to the necessary degree of closeness.

Dr. Rothwell Adam considered that the clamp was preferable to ligature, owing to the liability of slipping with the latter. But all mechanical appliances were open to the objection of necrosis, which was a source of anxiety until the third or fourth day after operation. He feared that the projecting point in Dr. Townend's clamp might do some injury to the adjacent intestine, or even the vagina. Another objection was in its weight, which would have a tendency to drag downwards. It seemed to him to be somewhat similar to Dr. Greig Smith's instrument. In his own practice he preferred to clamp off the ligament in portions.

Dr. Jeffcoat did not use the clamp, and preferred to ligature in sections. If any difficulty were encountered when operating in vaginal section he would complete the operation by abdominal section. In his cases of hysterectomy he resorted to ligature of the ligament, and was opposed to clamping.

Dr. Worrall strongly disapproved of the instrument exhibited. It must have too heavy a drag, and its point would be apt to entangle the intestine. He thought the principle of clamping bad; sectional ligature was much preferable. His own practice was to use three on each side. He would only use the clamp for the removal of a cyst. He would not agree with Dr. Jeffcoat in his remarks as to combining vaginal with abdominal section, as he feared such a course would be followed by peritoneal contamination. Myomata are best removed by Hegar's method.

Dr. Syme thanked the section for their valuable criticism. Whilst Dr. Townend's instrument had not met with general approval, it must be remembered that it was made in an emergency. It answered perfectly in the two cases in which it had been used, and there was no evidence in either of the suggested drag or weight, especially as it had been supported by suitable wool packing. He agreed with the President, that much risk was run in Dr. Jeffcoat's proposal of combined abdominal and vaginal sections—time was lost, and there was fear of shock and poisoning.

PUERPERAL FEVER.

By A. J. Garland, M.R.C.S. Eng., L.R.C.P.E., Oamaru, New Zealand.

In considering this subject I intend to restrict my remarks to puerperal fever of septic origin only; not to the specific fevers which may occur in the puerperal state. This definition will guide us both in prophylaxis and treatment, as it follows that our object will be first to prevent the formation of the septic poison, and should the patient evince symptoms of septic absorption, to destroy the ill effects if possible. I do not suppose that I can present any very new facts before you, as this is a subject which has received the careful attention of many thoughtful observers for a number of years. My apology for addressing you on this subject is that having found a certain line of treatment very successful, I wish to bring it under the notice of my professional brethren that it may receive extended application.

How, then, can we prevent the development of septic symptoms? In answering this question I shall of course take it for granted that every medical man in these days uses every antiseptic precaution; that he not only uses an antiseptic for washing his hands and for lubricating the examining finger, but that he examines, not oftener than is absolutely necessary, as almost all the information required can be gained by abdominal palpation, and that in the management of the third stage of labour, he never allows the uterus to become relaxed after the expulsion of the placenta, as I believe almost every case of puerperal fever originates from the decomposition of retained matter, clot, or membrane. I therefore maintain that it should be the routine treatment in all confinements to give ergot after the third stage, if it has not been necessary to administer it before, and I prefer to add a little liq. strychnine to increase the action of the ergot.

At the meeting of the Obstetrical Society of London, held on 2nd October, Dr. G. Robinson read a paper on micro-organisms of obstetrical and gynœcological interest, in which he stated that in normal labour the uterine cavity was known to contain no microbes, but in cases of puerperal sepsis many micro-organisms of different kinds were found both in the uterine cavity and in the substance of the decidua. He also pointed out the supposed connection of the bacillus coli communis with various inflammations (usually suppurative) of the human body. He quoted a case in which a woman four months pregnant had intestinal obstruction from retro-version of the gravid uterus. Abortion occurred four days after reposition, and was followed in a few hours by fever and diarrhœa, which continued until the death of the patient five days later. During life pure cultures of the bacillus coli communis were obtained from the uterine discharge, and after death these were obtained from the uterine cavity, peritoneum, and heart's blood. These facts may throw some light on the success of the treatment of peritonitis by saline purgatives, and may also open our eyes to another source of infection, and to a means of prevention by keeping the bowels from becoming costive.

Another question in the prevention of puerperal fever is, Are we to allow the nurse to syringe the patient with antiseptics in all cases? I think not, as unless carefully done, there is more risk in syringing than in doing without it in a case in which the lochia remains sweet, and there is no rise of temperature; but if in any case the patient has rigors and sweating, what is to be done? We must deal with the source and the results of the infection if we can. The source being some putrefactive agent, probably in the uterus, should be removed if possible. But how? The question of curetting under these circumstances seems to be on its trial. Many advocate its use, while many oppose it, and it seems to me to be a rash method of treatment to curette the uterus in the presence of infection, as the streptococcus pyogenes may so easily be planted in the new soil after the removal of the outer surface. A much safer plan is to swab out the uterus with strong carbolic acid or iodine, or with hydrogen peroxide (15 vols.), and to apply an iodoform pessary. By these means we may check the spread of the infection, but we must also deal with the system already poisoned; and in quinine we have almost a specific. I will here quote a case which occurred some years ago in my practice. A young woman in her second confinement, after a perfectly normal labour, progressed favourably until the evening of the third day, when I found her with a temperature of 104, pulse 120, sweating profusely after a severe rigor, the lochia very offensive. Antiseptic injections improved this, and I prescribed quinine in 5-grain doses every four hours. Next day the temperature and pulse were normal. The improvement continued for three days, when the quinine, producing unpleasant symptoms, was discontinued, and the temperature rose, but subsided on the resumption of the medicine, and the patient made an excellent recovery. I generally prescribe quinine in 5-grain doses, with hydrobromic acid and liquid extract of ergot to make sure of good uterine contraction.

How does the quinine cause these satisfactory results? Does it destroy the streptococcus pyogenes, which is always present in these cases, or is its action confined to the toxins, or is it by its action on the thermal centres that the reduction of temperature is produced. Judging by the great comfort the patients feel, I incline to the view that it destroys the toxins, which I consider the cause of the fever.

My object in this paper has been to bring under your notice this method of treating puerperal fever. Having found it successful in every case which I have met with for some years (fortunately septic cases are not common nowadays, still, with the exercise of the greatest care, they will occur), and I trust that others who may adopt this treatment will enjoy the same measure of success as I have done.

Dr. Purdy referred to two cases of puerperal fever which had recently come under his treatment. Whilst, of course, observing the most absolute surgical cleanliness, he did not believe in the possibility of aseptic midwifery in general practice. He never as a matter of routine used the syringe, which, without great care, might prove a source of infection. In one of his cases he had used injections of bichloride of mercury with perfect success. In the other the patient was apparently dying when he was called to see her. He prescribed quarter grain doses of the biniodide of mercury with 5 grains of quinine every three hours. He also syringed out the uterus with biniodide of mercury—1 in 1700 parts of the hottest water that could be borne. There was marked improvement in two days: the temperature had fallen to 102 degrees. Ten grains of antipyrine were then given, with the effect that in twenty minutes the temperature had fallen to 98·4 deg. Recovery ensued.

Dr. Rothwell Adam congratulated Dr. Garland upon his excellent paper. He could not speak in such favourable terms as Dr. Purdy had done, but that gentleman referred only to two cases. For practical purposes he thought we might range cases of puerperal fever under two divisions. In one the disease is located in the endometrium, and in the other it is intra or extra-uterine. The first class are the most frequent: the site of the poison is different, being more localised; there is more tendency to spontaneous cure and more response to treatment. In the second class the whole system is affected through the poison entering the sinuses, lymphatics, or extra-uterine areolar tissue. Treatment is of much less benefit; still great advances had been made during the past eighteen years. At one time very little more was done beyond a perfunctory washing out of the vagina. We now as a routine practice thoroughly cleanse out the uterus itself whenever a rise of temperature occurs where there is a suspicion of septic absorption. At the present time in all such cases he systematically cleanses out the uterus, and it was astonishing how much *debris* would often be removed. This might have to be repeated, as it may be impossible to make a thorough clearance at one sitting. He suggested its repetition in two days, unless the uterus contracted satisfactorily and the symptoms subsided. He considered curetting was necessary to effectually clean the interior of the uterus, and it might be repeated a third, or even several times, but the danger of perforating the softened uterus must be carefully borne in mind. Attention must also be paid to careful drainage, and if ergot has been administered, its action must be specially watched, as otherwise septic material might become pent up in the uterus from contraction of the inner os. Personally he had abandoned the use of the mercurial solution, and was well satisfied with frequent irrigation by a gallon or more of hot water. Packing lightly and draining with gauze should follow this procedure. He thought drugs were of very little use in puerperal fever. In desperate cases, where purulent deposits had infected the uterine tissue, the idea had occurred to him whether it would not be feasible to remove the uterus. He found that this had been actually done both in Great Britain and America. The difficulty was to judge as to the fitness of a case for so formidable an operation, which, to give a probability of success, should be adopted early. In one recent case, where the uterus had been cleared and drained and bad symptoms has persisted, hysterectomy had been contemplated, yet the patient recovered. In a very similar case operation was postponed and the patient died. By what data should we be guided? Perhaps sero-therapeutics gave hope for the future.

Dr. Batchelor thought that the importance of the local origin of puerperal infection was hardly yet sufficiently appreciated. He was convinced that putrid matter might remain pent up in the uterus for days without giving rise to any constitutional symptoms. He recalled a recent case where he has visited a patient in consultation who had only died a few minutes previously from embolism. The medical man who had attended the case carefully had assured him there had been no indication whatever of any constitutional disturbance, and yet the room in which the patient lay had a horribly offensive odour permeating it. This could not have been the result of *post mortem* decomposition, but a putrid discharge from the genitals. A short time afterwards a very similar case occurred in his own practice where a patient had made uninterrupted progress until the tenth day; a rigor then occurred, followed by high fever. On visiting the patient he syringed out a very considerable quantity of offensive discharge from the uterus. This could not have formed suddenly, but must have been in the uterus for some days and produced no symptoms. This patient eventually recovered. He thought curetting might be valuable in some cases, but it was often a hazardous proceeding. The uterine wall, when inflamed in addition to its normal softening, was often soft as cheese. He had himself passed a blunt curet through its substance without being able to appreciate any feeling of resistance. His experience of vaginal hysterectomy in these cases was very unfavourable. On two occasions in which he had been compelled to practise it both patients died; it was demoralising to anyone who regarded his statistical results. He considered he had seen good results following the free administration of salol.

Dr. Morton remembered a case where there had been no rise of temperature or constitutional disturbance until the eighth day, when there was a sudden rise to 103 deg. He irrigated and removed aquantity of foul matter from the uterine cavity, and the patient speedily recovered. He always used irrigation when the temperature rose above 99 deg. A scruple of quinine with ol. terebinth was very good in these cases. He thoroughly agreed with Dr. Adam in his remarks about gauze drainage.

Dr. Cleghorn said that his treatment was strictly preventive. Whenever he met with any difficulty he considered antiseptic measures absolutely necessary, and washed out all such cases. He thought the time not far distant when puerperal patients would be early made to assume the upright position and so assist natural drainage. Puerperal cases were kept far too much in the supine posture.

Dr. Hocken had seen perhaps thirty cases of puerperal fever, and considered that the best treatment was at first full doses of salicylate of soda, and afterwards quinine, with hot injections of boracic and carbolic solutions. But with Dr. Cleghorn he placed his faith in prevention. He did not approve of routine irrigations after labour. He used the forceps in quite 30 per cent. of his cases, and invariably removed the placenta immediately after the birth of the child, whilst the uterus was still patent, the nurse under direction making suitable pressure on the abdomen during the extrusion of the child. He felt that at the present time this practice would meet with but little sympathy, still he considered that it greatly minimised the danger of sepsis, as well as promoted an excellent recovery. After every examination, during the progress of labour, he washed his hands with fresh soap and water.

Dr. Young referred to a fatal case where a *post mortem* disclosed a quantity of stinking pus, though there had been nothing previously to indicate its presence. He considered it impossible to lay down any routine form of treatment; each case must be treated to its special features. It was important to have competent nurses.

Dr. Jennings thought Dr. Batchelor's cases very interesting. He had met with one similar where everything went well until the eighth day, when there were flushed face, sweating, and a temperature of 108 deg., which curiously enough fell within thirty-five minutes to 101 deg., and afterwards lower still. Next day, whilst the patient was being removed to a sofa, a profuse fœtid discharge came away, and irrigation was freely used, and the patient speedily got well.

Dr. Thomas relied on the use of quinine and stimulants in the treatment of these cases.

Dr. Worrall felt that they were much indebted to Dr. Garland for his excellent paper, and agreed with much that was said, especially that examinations during labour should be few, and chiefly external. Statistics seemed to him to vary so much as to indicate a want of complete care in tabulating the various forms of these cases. Quinine, whilst good, seemed rather to stimulate the vital energies than act upon the poison. The nurse should not be allowed to examine the patient during the progress of labour. He thought that treatment was mainly prophylactic. The bowels should be acted upon by enemata, and relieved in the sitting posture. He thought that active interference should be avoided. Curetting seemed to be almost routine in New South Wales; when this was practised he thought the patients almost always died. As has been pointed out, the uterine muscular tissue is softened, and Nature's efforts to limit the spread of the poison are prevented. But curettage should be used if pieces of membrane, placenta, &c., have been retained, as disclosed by foul odour or the touch. Drainage is of the greatest value, and as Dr. Adams truly says, iodoform gauze is not to be surpassed. Gauze should always be used after curetting. Another objection to the general use of the curette is that in many cases the poison is systemic—it is beyond the reach of the instrument. This also is an objection to the removal of the uterus. Irrigations may be valuable, but if no good result follows two or three they should be discontinued. Sometimes patients complain that rigors follow their use. He thought it wrong to remove the placenta under twenty minutes—before uterine contraction takes place. Semelweiss showed that those physicians who used disinfectants prior to making examinations during labour had fewer septic cases than those who used water only.

Dr. Garland, in reply, said that firm contraction of the uterus was of the utmost importance, and that was why he advocated the routine exhibition of ergot. The explanation of cases such as quoted by Dr. Batchelor was that the uterus had relaxed, an accumulation of discharge had taken place in which putrefaction had occurred; this did not result if firm contraction was kept up. With Drs. Batchelor and Worrall he believed there was danger of perforation in curetting, and also the danger of converting a local into a systemic infection. He gave quinine, believing that it prevented the multiplication of the bacilli, and consequently decreased the formation of toxins. It had been proved that the bacilli of malarial fever were destroyed in a solution of quinine; thus, in a case of systemic infection, where the poison could not be removed, it could be counteracted. The upright position should be adopted in all cases when possible, to assist in free drainage of the uterus.

ANTISEPSIS TEMPERATURE.—RAPID DILATATION OF THE OS DURING LABOUR,

By JAMES R. PURDY, M.B., C.M., Hutt.

I had originally intended to write a paper for this Congress on the general subject of "The Rapid Delivery of Women in Labour," and in part made a rough draft of my paper, but as owing to the change of date it was just probable I might not be able to get to the meeting; and finding the paper necessarily a lengthy one, I deemed it advisable to select one particular series of cases and write a few short notes on that. I have always practised rapid digital dilatation of the os in certain cases, and have found it a most valuable help. I have now attended nearly 2,000 cases without a maternal death—the only death I have seen in my midwifery practice being one from puerperal eclampsia at the seventh month, a case practically hopeless when first seen, consequently I think I need not enlarge on the fact that, at least in experience, rapid dilatation has not been a risky procedure. I have never used Barnes' or Champetier's bag. They are no doubt very useful; but as digital dilatation has always succeeded with me, I have not found it necessary to use any other method.

Most text works on midwifery have chapters on slow dilatation of the soft parts, so I need not weary this meeting by going over ground known to all. I do not want to pick out particular cases. On the other hand, a history of all the cases in which I have adopted the method would take up too much time and prove wearisome, so I have copied from my case book the following notes on cases in which I have rapidly dilated during the past eighteen months, having in that time attended eighty-two cases. This does not, however, represent a fair average of times in which I have used it previously, seeing that I adopt the method more and more as time goes on:—

No. 1 (case 2), 13th July, 1894. Mrs. M., aged 21, 2-para. Placenta prævia centralis; labour commenced on the seventh month; when seen os barely admitted one finger; she had lost a good deal of blood; placenta could be felt; diagnosis was clear, seeing there had been two attacks of hæmorrhage previously; rapid dilatation first with fingers, then with forceps blade and blades, and as soon as possible head was delivered by forceps; owing to hæmorrhage gave no chloroform; very little blood was lost after commencing to dilate; mother and child did well. In this case I finished dilatation with forceps blades, because patient not being under chloroform I did not want to pain her unnecessarily by passing hand into vagina. Mother and child did well.

No. 2 (case 8), 30th July, 1894. Mrs. L., aged 32, a 10-para. Previous history: has always had lingering labours, lasting sometimes three days. Patient had been about twelve hours in labour when I saw her. On examination os admitted two fingers, head was presenting normally, but was arrested at brim; uterus seemed flabby; pains, although causing great suffering, had little effect on os; gave chloroform; dilated rapidly; applied forceps at brim. Mother and child did well. Whole proceeding took about half-an-hour.

No. 3 (case 21), 24th October. Aged 33, a 2-para. Membranes had ruptured early; on examination head low down; os tense, admitting one finger; patient objected to chloroform; gave 30gr. of chloral; waited two hours; os still tense; pains frequent and violent; patient asked for chloroform; under chloroform os became flaccid; rapid dilatation; delivery by forceps. Mother and child did well.

No. 4 (case 30), 16th December, 1894. Mrs. L., aged 21, primipara. Membrane ruptured early; when seen violent pains; os admitted one finger; head presenting; chloroform; digital dilatation; delivery by forceps.

No. 5 (case 32), 31st December. 1894. Mrs. S., aged 35, a 5-para. Has always had lingering pains; never been attended by a medical man; did not send until some hours in labour; brow presentation; os admitted two fingers; chloroform; dilatation; forceps; difficult; uterus was very flabby, contracting feebly for some time. Mother and child ultimately did well.

No. 6 (case 33), 1st January, 1895. Mrs. R., aged 33, 7-para. Membranes ruptured early; os admitted two fingers; chloroform; forceps; easy. Mother and child did well.

No. 7 (case 35), 22nd January, 1895. Mrs. D., aged 36, primipara. Membranes ruptured early; on examination os dilated size of five shilling piece; very violent pains; chloroform; digital dilatation; forceps. Mother and child did well.

No. 8 (case 52), 3rd April. Mrs. G., aged 26, primipara. Had been in labour thirty-six hours; membranes had ruptured early; on examination os size of finger tip, very flexible; head presenting; occiput anteriorly at brim; pains very violent; gave chloroform; dilated os rapidly. Head did not come down; applied forceps at brim with considerable difficulty, as head was very hard and wedged. Patient was petite, about 4ft. 11in. in height. Could make no headway with forceps; wanted very much to save child, so after some difficulty turned. After breech was delivered and arms brought down it took nearly an hour to deliver the chest, it was so large and well set; during delivery of the shoulders perineum was torn; patient was under chloroform two hours; child, a boy 10lb. in weight, was dead. Mother ultimately did well.

No. 9 (case 61), August. Mrs. B., aged 41, 10-para. Patient had never had chloroform in her previous labours, she was very anæmic and neurotic; her three previous confinements had been most anxious ones. She had always been attended by a medical man; had always had very lingering labours. I had never attended her before. On examination os admitted two fingers, and was very thin and flaccid; uterus flabby; gave chloroform, which she took well; dilated rapidly; turned. Mother and child did well.

No. 10 (case 68), 23rd September. Mrs. T., aged 20, primipara, a hæmophilic. Mother had p.p. hæmorrhage after every child, some twelve or thirteen, and died of p.p. hæmorrhage with her last. Three of the sisters of Mrs. T., who are married, have had three children each, and every time they have had p.p. hæmorrhage. Patient when seen had been twenty-three hours in labour. On examination found head pressing on perineum; pains violent and frequent; os only admitted forefinger; cervix thin and stretched;

gave choloroform ; dilated with fingers and forceps blade and blades. In twenty minutes from commencement os was widely dilated and child was easily born. Immediately after labour removed placenta Uterus was very flabby ; cord very fragile, so I removed placenta by introducing hand into uterus. Immediately after removal of placenta reintroduced hand into uterus, using it as a plug, at the same time squeezing uterus on the hand with the other hand outside of abdomen. There was very little hæmorrhage. Mother and child did well.

No. 11 (case 75), 8th October. Mrs. S., aged 34, 6-para. Labour commenced at seventh month with profuse hæmorrhage. On examination found placenta presenting centrally. Patient had lost a great deal of blood, and was blanched and almost pulseless; os barely admitted forefinger; rapidly dilated ; turned ; child had been dead some days ; gave no chloroform. Mother did well.

No. 12 (case 76), 13th November. Mrs. S., aged 36; 10-para. Called in when up country seventeen miles from home, no instruments, &c., with me. Found patient had been in labour thirty-six hours ; was suffering continuous pain ; membranes had ruptured early ; os barely admitted forefinger ; head was low down and very movable ; dilated rapidly and turned ; all over in twenty minutes. Mother and child did well.

No. 13 (case 80), 20th December. Mrs. H., aged 21, primipara. Membranes ruptured early ; os admitted forefinger ; been in labour some hours ; chloroform ; digital dilatation ; forceps. Mother and child did well.

No. 14 (case 81), 22nd December. Mrs. W., aged 23, primipara. Os admitted one finger ; been in labour some time ; membranes ruptured early ; chloroform ; digital dilatation ; forceps. Mother and child did well.

No. 15 (case 83), 8th January, 1896. Mrs. R., aged 41, 9-para. Never attended by a medical man. On examination found os very high up and tilted forward ; posterior lip very much thickened ; could just reach presentation, os admitting tip of forefinger. Patient objected to chloroform ; gave 1gr. opium as she was in continuous pain, aggravated at intervals by increased pain. Waited six hours, found opium had lessened continuous pain, but labour pains were now distinct, though at long intervals ; os was a little more dilated or rather dilatable ; passed hand into vagina and then found the swelling of the os was due to pressure on the sacrum, which had a large boss on it ; head was very movable, but it appeared to me that labour, which had now lasted some twenty-four hours, might go on for a considerable time, so I ultimately persuaded patient to take chloroform ; rapidly dilated and turned. Mother and child did well.

The notes are taken from my case book as written, with the exception that in many of the cases I have contracted them in order not to prove wearisome. In all cases the dilatation was rapidly concluded. Certainly in no case did it take more than half an hour.

Dr. Mickle said that digital dilatation was an old practice. He adopted it, and principally during the pains. He would ask what allowance of time Dr. Purdy made for perineal dilatation. He had also for years used belladonna where the os was rigid—5 minims every twenty minutes, until a drachm had been given, and he then expected that labour would be completed in two or three hours. It had, however, a tendency to cause or increase hæmorrhage.

Dr. Adam asked what was the condition of the os and cervix months after this forcible dilatation.

Dr. Jennings asked what was Dr. Purdy's procedure when the os was high up. When low down it was doubtless feasible. He had found that Barnes' bag had failed to cause dilatation. He had used a rectal dilator at one time, but ceased its use, as it gave the patient great pain, and the os surrounding the instrument felt like a piece of wire.

Dr. Worrall thought digital dilatation very useful in urgent cases, such as eclampsia, &c. Beyond this he was quite opposed to the practice in the cases narrated by Dr. Purdy. The head of the child was the best dilator. In placenta prævia he thought the bipolar method the best.

Dr. Purdy replied that in dilatation he made no difference, pains or not. That nearly all these cases were up-country, and had been in labour some time, the membranes having ruptured early. Chloroform always made the perineum soft; he had never met with ruptured perineum in rapid dilatation. So far as he knew no cervix had been lacerated. In a recent number of the *British Medical Journal* he noticed a German authority, whose name he had forgotten, contends for the more frequent use of the method. In placenta prævia centralis he would usually dilate, and as soon as possible bring down a foot. In some cases, however, it would be preferable not to use the bi-polar method, but let the head come first. Each case must be judged by itself.

NOTES ON PUERPERAL ECLAMPSIA, WITH SPECIAL REFERENCE TO UREA EXCRETION.

By Wilton Love, M.B.,

Hon. Visiting Physician to Lady Bowen Maternity Hospital, Brisbane.

To a tyro approaching the subject of puerperal eclampsia from the standpoint of the text books, the disease is a difficult one of which to obtain a reliable conception as to its pathology and its treatment. The symptoms are clear and definite enough to warrant the expectation of a greater unanimity on the part of authorities as to the morbid processes which result in the convulsive seizures so dangerous alike to mother and child. It is now pretty generally accepted that the disease is uræmic in origin, and due to the retention of waste nitrogenous products in the blood from renal insufficiency, though in his last edition Playfair says: "While the urinary origin of eclampsia has been pretty generally accepted, more recent observations have tended to throw doubt on its essential dependence on this cause, so that it can hardly be said we are yet in a position to explain its true pathology." Again, the authorities are divided on the treatment by venesection, induction of labour, and the use of morphia. During the past few years I have met with fifteen cases inside and outside the hospital, and have seen eight others as consultant. Of my own cases, twelve mothers have recovered, while three died (one with double pneumonia), while six infants have survived and nine died. Of these fifteen, eleven were seized with convulsion at or near term and before delivery, four being *post partum* cases. Total—Seventeen before, six after. I append the notes of several of these cases.

R. S., aged 21, 1-para; admitted Lady Bowen Hospital at 5 a.m. on 6th November, 1886, suffering from convulsions; three fits from 10.30 to 11 a.m.; unconscious; morphia and pilocarpin, $\frac{1}{4}$gr. and $\frac{1}{6}$ respectively injected at intervals of half-an-hour; labour started with Barnes' bags; morphia and pilocarpin used from time to time during the day, and dilatation proceeded with; at first, fits occurred every half-hour, then every twenty minutes, and just before delivery every fifteen minutes; had twenty-five fits between 10.20 a.m. and 7 p.m.; rectal injections of chloral also used; delivered with forceps at 9 p.m.; child stillborn; another long and severe fit after delivery; temperature in vagina, 104·6 deg.; pulse, 170; urine solid on boiling; fits became more prolonged and intervals between them shorter, almost continuous between 10.45 and 11.45; coma became deeper and deeper till she died at 5.30 a.m., never having recovered consciousness since the first fit.

Mrs. W., aged 30, married 9 years. Had a miscarriage at second month one year after marriage; seven years ago became pregnant again; suffered much from œdema of legs and severe headaches; at sixth month was seized with convulsions, and was attended by Drs. May and Thomas, of Bundaberg; had over thirty fits, and was unconscious for nearly forty hours; convulsions ceased, and twenty-four hours after fœtus was born dead; recovered slowly; mind somewhat deranged for some time after; another miscarriage twelve months ago. Present history: Expected to be confined on 26th July (twelve days later); severe vomiting during early months; latterly good health; on 13th had severe headache all day; no labour pains; convulsions began at 11.40 p.m. on the 13th, recurred at 12.30; seen at 1 a.m. (14th); slight œdema of feet; urine, $\frac{5}{8}$ alb., dark, with some blood in it; conscious, but dazed, and thinks "she must have had a fit;" very much afraid of fits after previous experience. Fits occurred at 11.40, 12.20, 1.10, 5, 7, 12.30, and 3.30—seven in all. Treatment consisted in (1) Dilatation of cervix with Barnes' bags, and subsequent use of forceps; delivery effected eleven hours after first fit; (2) Chloral, 20gr. by mouth, at 1, 3, 7, and 11, and 30gr. per rectum at 5 a.m.—in all, 110gr. in eleven hours; (3) Morphia, $\frac{1}{4}$gr. subcutaneously at 1.30, 5.30, and 12.40 —$\frac{3}{4}$gr. As the fits recurred twice after delivery, and were more severe in type, I took 22oz. of blood from the right median basilic vein; no further convulsions occurred; 2 pints normal saline solution were injected into rectum at 4.30, 8.30, and 12.30, after the venesection. The patient made a slow recovery, acute sepsis supervening, with subsequent formation of an abscess over acromion, near shoulder joint; temperature fell to normal the day after this was opened. Child survived twenty-four hours — small and puny. Urine, 8oz. passed before fits, ⅝ alb., smoky; 7oz. drawn off immediately before delivery, ⅞ alb.; 40oz secreted from 10 a.m., 14th, to 10 a.m., 15th, ¼ alb., sp. grav. 1020, urea 243·186gr. Next day she passed 75oz., alb. ⅛, urea 385·312gr. Within three days of delivery all alb. had disappeared, and the normal amount of urine was excreted, and the urea had risen to 310 and 316gr. The blood which was drawn from the arm was examined for urea by Haycraft's method, which consists in dialysing the blood repeatedly into absolute alcohol, converting the urea into oxalate by oxalic acid, evaporating to dryness, removing the fat and pigment with petroleum ether, dissolving in aq. dest., and neutralising with Ba Co_3, evaporating to dryness, extracting residue with absolute alcohol (boiling), filtering and evaporating. The product is estimated by weighing or by the hypo-bromite method. The 22oz. of blood thus estimated yielded 1·0676 grammes, or 16·476 grains.

Annie V., aged 20, 1-para. Confined 10 p.m. on 18th May; six hours labour, normal. First convulsion, 6 a.m. on 19th (eight hours after delivery); 2nd, 8 a.m.; 3rd, 11 a.m.; 4th, 4 p.m.; 5th, 6 p.m. Urine drawn off after second fit, 6oz., ½ alb. No urine passed till drawn off at 10 a.m. on the 20th, 14½oz., ⅝ alb., 64gr. urea. Fits recurred at 6 p.m. on the 20th, and at 8 p.m. I bled her to 9oz.; no further convulsions took place. Next day she passed 31½oz. = 276gr. urea. The 9oz. of blood withdrawn were examined by Haycraft's method and yielded 6·74gr. urea.

Mrs. C., aged 22, was attended by me two years ago with her first baby. She was seized with convulsions which recurred for eight hours, during which time she had nine fits. Urine ¾ alb., smoky. Labour was induced and completed with the forceps, after which no convulsions occurred. The child lived. All alb. disappeared in thirty-six hours. On 13th April, 1894, she again consulted me, as she was seven months pregnant, and the symptoms which had occurred prior to the first confinement were again making their appearance—viz., giddiness, headaches, and œdema, feet and hands swollen at night, and œdema under eyes in morning. Urine 55oz.; no albumen or blood; urea 340gr., by Russell and West. From this time out, till the confinement the urine was collected and estimated about twice weekly, and when the urea fell diuretics were ordered and the diet regulated. The albumen steadily increased to nearly half before delivery, but the excretion of urea never fell below 225gr., at which time the headaches were very violent, though there was but a trace of albumen. The confinement was uneventful, but the child was small and puny. I append at foot a list of the estimations.

I will not detain you with any further detail of cases, as the ones already quoted will furnish a text for my subject. Albuminuria, *per se*, in a pregnant woman is merely a straw which shows the way the wind blows, and suggests careful watching, but my experience and my reading lead me to believe that it is not in cases of essential nephritis that we have most cause to fear eclampsia. Goubert records 164 cases of albuminuria before delivery, of which 95 had no eclampsia, and Blot 41, of which 34 were delivered without untoward symptoms. In Case 4, when the symptoms were most severe, there was but a trace of albumen. In none of the cases which I have recorded could I find any tube casts suggestive of either acute or chronic nephritis. There are two classes of cases of albuminuria which should always be separated—(1) Those due to epithelial desquamation of the tubules where tube casts are found—sometimes called cylindruria, and (2) those due to transudation of albumen through the renal capillaries, such as is sometimes seen in mitral cases, in which no casts are found. I take it that the albuminuria of pregnancy which precedes eclampsia belongs to this latter class, and I am led to this conclusion by the absence of tube casts and the rapid and complete disappearance of the albumen after convulsions cease. Braxton Hicks suggests that the albumen is caused by the convulsions, and there is little doubt that the convulsions increase the amount of albumen, and even give rise to blood appearing in the urine; but still I have not found casts even in these cases; consequently I incline to the view that we must look not upon albuminuria, with its consequent hydræmia, as the cause of eclampsia, but upon renal inadequacy, or failure of the kidneys to excrete sufficient of the nitrogenous waste, and as the great bulk of that nitrogenous waste is normally eliminated as urea, I believe that retention of urea is the cardinal exciting cause. Whether this retention of urea be due to pressure on ureters or portal circulation, or whether the urea transformation in the liver be defective, is yet uncertain, and I have no means of inquiring into this. Taking this renal inadequacy, with retention of urea, as fairly satisfactorily proved, how does it influence our prophylaxis and treatment. With your permission I will recapitulate some of the known facts regarding urea excretion which, if remembered, will go far to help us.

Urea $CO(NH_2)_2$ or carbamide is the chief end product of the oxidation of the nitrogenous constituents of the body. In normal urine it is excreted to the extent of about 30 to 40 grammes, about 500 grains per diem by a healthy man. This estimate I have found somewhat high, especially in hot weather, as the result of a number of control estimations, 400 being seldom exceeded under average conditions of diet and exercise. Women excrete relatively less, and children relatively more, than men. The amount is increased by (1) Increase of proteids in the food; (2) By drinking large draughts of water; (3) By various salts; (4) By frequent urination; (5) Diabetes. The salts which increase the amount of urea are chiefly those which increase the urinary and bile secretion and morphia among others. Quinine, which diminishes tissue metabolism, decreases it. Keeping these facts in mind we turn to the treatment of eclampsia and its prevention.

Where symptoms which point to insufficient excretion of urea exist, especially where accurate examination has confirmed the suspicion, the duty is plain. The diet should be as simple as possible—plenty of milk and farinaceous foods—the less meat or proteids (excepting, of course, milk) the better. If the urinary secretion is below the normal in quantity, diuretics should be given. Induction of premature labour is naturally thought of, but all the authorities I have consulted condemn it unanimously, some even if eclampsia has already supervened. Thus, Gooch says, "Attend to the convulsions and leave the labour to take care of itself." Schroeder—"Especially no kind of obstetric manipulation is required for the safety of the mother." Tyler Smith—"Adopt the course which seems least likely to prove a source of irritation to the mother." Playfair—"If, therefore, the os be undilated and labour has not begun, no active means to induce it should be employed, although the membranes may be ruptured with advantage, since that proceeding produces no irritation. Forcible dilatation of the os, and especially turning, are strongly contra-indicated." Charpentier—"Induced premature labour is only justifiable in exceptional cases where medical treatment has entirely failed. Cæsarian section and forced labour are absolutely unjustifiable. Labour should be allowed to end spontaneously wherever possible."

In the face of such advice one naturally hesitates to adopt active measures, and probably increased experience may alter my views; still one of my cases when this advice was followed died, while in nine others where labour was initiated or expedited good results followed, also in other six cases which I saw with others.

If there be anything in the pressure theory, certainly *causâ sublatâ tollitur effectus.* Again, I have seen labour pains induce fresh fits—a natural source of irritation which may be removed by helping labour. The same authorities are again pretty emphatic in their denunciation of venesection. Playfair says: "Many cases are recorded in which a patient in apparently profound coma rapidly regained her consciousness when blood was abstracted in sufficient quantity. The improvement was, however, often only transient, the convulsions recurring subsequently with increased vigour" (Playfair, page 326).

To the practical obstetrician theoretical objections are vain compared with the results of experience, and there can be no question that venesection has been successful in hundreds of cases where other treatment has conspicuously failed. It is quite feasible to assume that the concrete abstraction of urea, involved in venesection, reduces the toxic power of the blood on the nerve centres, for increased absorption of lymph from the perivascular lymph spaces takes place rapidly after a moderate bleeding. There is probably a saturation point in the blood, as regards urea, beyond which the nerve centres will not be tolerant and convulsions supervene. If, then, this degree of saturation be lowered, the nerve centres become again tolerant.

In health urea is present in the blood to the extent of 1 in 10,000, but in the estimations of blood drawn during eclampsia, quoted above, assuming the total quantity of blood in the body to be 9lb. (Landois), the quantity of urea circulating in the blood was 108gr. and 106gr. respectively, or 1 in 582 and 1 in 594. But loss of blood lowers arterial tension, and with it the secretion of urine and the elimination of urea, and, with the object of compensating for this, I have on many occasions administered rectal injections of normal saline solution—usually about 2 pints every two hours—and I have every reason to be satisfied with the result. This treatment was suggested to me by the late Dr. Bancroft. If the Traube-Rosenstein theory be correct, this proceeding should increase the convulsions.

This may appear to be rough reasoning, but I have sufficient confidence in it to repeat it again if occasion should arise. Not only will the tension be raised, but the absorption of fluid will tend to promote diuresis and elimination of urea. Venesection, however, should not be considered so much of a specific that other remedies can be laid aside; consequently it is wise to continue the use of chloral and morphia to keep the nerve centres quiet until the process of elimination has again restored the equilibrium of the ratio of urea in the blood.

MRS. C.'S CASE.

Date.		Urine, oz.	Alb.	Remarks.	Urea in Grains.	Sp. Grav.
April	13	55	None	Œdema of feet, hands, and eyes ; giddiness	340·352	—
,,	16	73	,,	Some œdema at night, no giddiness	345·87	—
,,	21	40½	,,	Lumbar ache, œdema slight	312	—
,,	24	62	Trace	—	271·75	—
,,	30	61	,,	—	374·4	—
May	3	33	,,	Severe headache, last two days ; diuretics ordered	225	1024
,,	7	60	,,	Headache better	362·4	—
,,	10	62	—	—	320·8	—
,,	15	46	$\frac{1}{6}$	No œdema (8 p.m.)	367·8	1018
,,	20	58	$\frac{1}{8}$	Headache, flashes of light	245	—
,,	22	44	$\frac{1}{6}$	Some œdema	297	1018
,,	26	48	$\frac{1}{4}$	—	353	1019
,,	29	69	$\frac{1}{8}$	—	350·836	1015
June	2	69	$\frac{1}{8}$	—	332·71	1016
,,	8	48	$\frac{5}{12}$	—	269	1019

Confined 15th June ; no eclampsia.

Dr. Rothwell Adam complimented the author on his excellent paper. He had, of course, seen many cases in a long hospital practice. It was a curious fact that pregnancy, which was a natural condition, might produce all the dire symptoms of nephritis, which would so soon disappear after delivery. This fact was inharmonious with the older views and theories of its causation. Ten or twelve years ago Barnes sought to explain it and concomitant eclampsia by increased nerve and blood tension. But this is quite inadequate, something further is requisite. However it may arise there is an undoubted increase in the waste products of the blood. The treatment of these desperate cases, where there is eclampsia, lies in one direction. If unaided, death is the result. The large proportion of those delivered recover, therefore the rule is to rapidly evacuate the uterine contents. Uncomplicated cases of nephritis should be treated by hot baths, packing, and dieting, under which the albumen and œdema will decrease. Recently, at the Women's Hospital in Melbourne, six very similar nephritic cases were admitted, which, with the exception of one, improved under the treatment now suggested, and were later successfully delivered. In the sixth case he induced labour, not because of eclampsia, but of extreme breathlessness. Much judgment must be exercised in every case.

Dr. Jennings's opinions coincided with those of this excellent paper. Pilocarpin was not so reliable as had been thought. In a recent case he had used it with no effect, bleeding was refused, and the patient died. In another patient there were severe headache and sickness, and upon the latter symptom he would like to lay especial stress as being so often premonitory of eclampsia. Within two days the symptoms practically disappeared under the use of vapour baths, purgatives, milk diet, &c., and labour was successfully accomplished a week later.

Dr. Symes was much pleased with the paper. He considered that the excretion of urea and uric acid were on parallel lines. Pathologically, he thought the latter to be much the more important, as it raised the arterial tension so much more than the former, and has thus more to do with the causation of eclampsia. He had treated cases with gallic acid, and with good results. He agreed as to the value of saline injections. In one case of eclampsia he bled to 15oz., but the patient died. There is a danger in effecting too rapid delivery of lowering the arterial tension too suddenly. The effects of pilocarpin are too limited, and do not last. Sickness, as Dr. Jennings says, he has observed to be a symptom of coming eclampsia. As medicines, he would be inclined to use salicylates and salines.

Dr. Purdy had seen five cases of puerperal eclampsia. He had bled one to 50oz., and given chloroform. The others all recovered with pilocarpin injections. In spite of the opinion of many authorities, he believed it was the duty of the practitioner to empty the uterus. Nature gave the cue in attempting delivery, and her indications should be followed.

Dr. Hocken had seen many cases of these convulsions, and he considered that a large venesection should hold the first place in treatment. It produced a speedy and favourable effect in lowering the tension and subduing the convulsion. Then chloroform should be given, and the evacuation of the uterine contents undertaken. As to the treatment of nephritis dependent on pregnancy, he was in accord with that laid down by previous speakers. He thought that daily doses of Pulv. Jalap. Co. were more valuable than of any other drug in reducing the œdema and albuminuria. Dr. Love's paper was a very thoughtful and valuable one.

Dr. Worrall considered the paper read by Dr. Love a very valuable one. Had Dr. Love examined cases of nephritis, apart from those accompanying pregnancy, and critically compared them? He thought that Nature's refusal to eliminate in the latter class of cases was owing to increase of nerve tension. This view directed his treatment, which was to empty the uterus, despite the array of opinion on the opposite side. He thought that the evil effects of uric acid, portrayed by Dr. Symes, were very minor as compared with those of urea. Saline injections are an adjunct of the first importance with whatever other treatment it may be considered best to adopt. They are absorbed, and diuresis is increased, as shown in the paper. Comparable with them is the present day treatment of typhoid with large draughts of water, whereby the tissues are flushed and the circulation steadied. If the albuminuria of pregnancy persists and increases in amount, the question of induction of premature labour must be entertained, as that is apt to be followed by chronic disease. He agreed with the value Dr. Jennings placed upon sickness or nausea as a premonition of eclampsia. He called to mind one case in which he had not given sufficient importance to this symptom.

Dr. Love was gratified with the discussion upon his paper, and thought that a plan of treatment might be elicited from the various opinions uttered. With regard to pilocarpin, he thought that the question had been thrashed out at the Adelaide Congress, and that every speaker condemned its use. It may remove water from the blood, but it produces cyanosis and water-logging of the bronchioles. He had found urea in the sweat induced by pilocarpin.

He had no opportunities of paralleling the two forms of nephritis, as suggested by Dr. Worrall; but in both, the diminution of headache indicated a diminution of urea. Was the nephritis of pregnancy in any measure due to what we might call the scavengering operations of the mother, with regard to any excretions from her fœtal child? Dr. Symes's opinion regarding urea and uric acid was hardly that taken by authorities.

TREATMENT OF RETRO-DISPLACEMENTS OF THE UTERUS,

By Ralph Worrall,

Hon. Gynecologist to the Sydney Hospital.

The subject of retro-displacements of the uterus is being much debated at the present time, and I have therefore thought it might profitably engage the attention of the gynecological section of this Congress. One of the most common and incapacitating of the ailments peculiar to women, it must be of interest to every general practitioner as well as to the gynecologist; yet I venture to say the indications for the different methods of treatment are not laid down with sufficient clearness in any one of the recent text books in gynecology.

Before discussing the treatment of retro-displacements, it would be perhaps as well to review the means by which the uterus is maintained in its normal condition. These are round, broad, and utero-sacral ligaments, the tonicity of the vagina and pelvic floor, and last, but not least, intra-abdominal pressure, which enables the uterus to float amidst surrounding organs. Although this last is the most important of the forces which keep the uterus in its normal position, yet without the others its influence becomes not only valueless but positively harmful—*e.g.*, if there be more or less destruction of the pelvic floor, patulous ostium vagina, with hypertrophy and sagging down of the vaginal walls, any increase in intra-abdominal pressure, as in straining, forces the uterus downwards, and there being no answering increase of pressure below by contact of the vaginal walls and contraction of the pelvic floor, the organ with its appendages is drawn again into normal anteversion solely by the elasticity of its ligaments; and as all elastic structures tend to become exhausted, it is only a question of time for retro-displacement to be established and maintained by the action of the very same force which had previously acted in an entirely opposite manner.

The first step then in the treatment of this condition is to ascertain if there be any other associated lesion, such as ruptured perineum, cystocele, rectocele, lacerated cervix, endometritis, chronic metritis, oophoro-salpingitis; also if there be habitual neglect of the functions of the bladder and bowels, or undue pressure of clothing around the waist. I am inclined to think that these points are often ignored, and that when a retroversion is discovered a pessary is often inserted regardless of whether it may not, by increasing the ectropion in lacerated cervix, or by pressing on appendages adherent in Douglass's pouch, tend to intensify the symptoms from which the patient suffers.

In order to invite and facilitate discussion I shall describe the treatment which, in my opinion, should be adopted under different circumstances.

As endometritis almost invariably exists I usually begin by a curettage and application of iodine, or zinc chloride solution to the endometrium; any lesion of the pelvic floor or cervix is at the same time rectified. Then if the case be recent, warranting the hope of cure without operation, the uterus being freely movable, not tender, and the appendages normal; or, if, although the condition may have been of some standing, there be reasonable hope of pregnancy taking place, I insert a pessary.

If on removing the pessary at the end of a month, in recent cases, the condition recurs; or, if in chronic forms pregnancy does not ensue in, say, six months, I regard this mode of treatment as a failure, and advise operation. I may be asked what percentage of cures in *chronic* cases may be hoped for by the use of the pessary. In my experience, which must extend considerably over a thousand cases, I cannot recall a single instance, save those in which pregnancy took place. I say, therefore, that it is not to be tolerated that a woman should be condemned to indefinitely wear an instrument which favours sepsis, causes discharge, interferes with marital relations, and promotes introspection.

A word as to the form of pessary when it is deemed advisable to adopt this mode of treatment. The Albert Smith, made of hard rubber, highly polished, is undoubtedly the best, being light, non-irritating, non-absorbtive, and conforming to the natural shape of the vagina—pear shaped, with the base above. All soft rubber pessaries, such as the Meigs ring, are highly objectionable. I never use them except in very old women with procidentia, in whom, owing to the general condition, operation is out of the question. With regard to the best method of restoring the retro displaced uterus, previous to inserting the pessaries, it will be found that in a large proportion of cases bimanual restoration will cause much pain. With proper precautions the sound may be employed with perfect safety, the ill results attributed to its use being due to roughness, and particularly to want of care in cleansing the os by scrubbing with Lysol or other solution before inserting the sound, which is best done through a speculum. In concluding the subject of pessaries I would say their use is contra-indicated under the following circumstances:—

1. In the virgin or unmarried girl.
2. When lesions of the pelvic floor or cervix are present.
3. When there is granular erosion of the os and endometritis.
4. When the uterus cannot be completely restored and retained in normal position.
5. When, although the uterus can be restored, the appendages are prolapsed and cannot be elevated with the uterus. (It is a mistake of frequent occurrence, and productive of much evil, to retain the uterus in its position, when possible, regardless of whether or not the appendages have also been restored. A moment's reflection enables one to see that under these circumstances drainage from the tubes into the uterus is greatly obstructed, both by kinking of the tubes, and the influence of gravity.)

7. When it is evident that unless resort be had to some other means, the patient must continue to wear the pessary for the term of her natural life.

Having, then, decided against the use of a pessary in any of the above circumstances, what other means are at our disposal? I shall confine my remarks to the two methods in which alone I have had experience, and I place first the operation devised by my friend Dr. William Alexander, of Liverpool, which I introduced to the profession of New South Wales eleven years ago. This operation has now been before the profession for about fourteen years, and in spite of unmerited abuse from those—some of them, I admit, distinguished surgeons—who, not having seen it performed, were necessarily ignorant of important points in the technique, or who resorted to its use in unsuitable cases, at the present time it may, I think, be said to hold the field as the most frequently-adopted operation for the cure of this distressing condition. Surely if it were as powerless for good and as potent for evil as some opponents have contended it would long since have sunk into oblivion, like so many of the treatments and procedures which have enjoyed for a time a widespread but ephemeral popularity.

The operation is not difficult when it has been practically explained on the living or dead body, but written descriptions are insufficient.* I shall merely touch upon a few points in the technique which my own experience indicates as important. The aseptic precautions must be as thorough as for abdominal section, otherwise the operator will sooner or later certainly suffer a loss of reputation, and may possibly have to deplore a fatal result. Curettage and iodine injection should always precede the shortening of the round ligaments, and defects of cervix, vagina, and pelvic floor should also first be attended to; but all the procedures should be carried out at the same sitting; thus in the last case in which I operated I did curettage, trachelorrhaphy, kolpo-perineorrhaphy, and Alexander's operation, the whole occupying one hour and thirty-five minutes. The time would have been much less but that I had a difficulty in finding one ligament and had no one to thread the many sutures necessary in the vaginal operations. The uterus was restored bimanually after finishing the vagina, and this was then packed with gauze, which was removed in three days. If no plastic operations have been performed I repack the vagina every two days, but it is not necessary, as a very slight force acting on the uterus in a forward direction is sufficient to enable intra-abdominal pressure to come into play on the posterior surface of the uterus, and maintain the organ in anteversion. On examination of this patient the day before leaving Sydney, and twenty-one days after operation, I found the uterus well forward and all wounds healed by first intention, without the slightest suppuration. The incision should be quite clean down to the aponeurosis, and there should be as little as possible bruising or tearing of the various structures. It is important to draw forward the entire slack of the ligaments, cutting away the superfluous portion.

No pains need be taken to put back the peritoneal investment of the ligament, as advised by some; but the crural branch of the genito-crural nerve, which, by the way, is an important guide to the ligament, should be carefully drawn aside, lest its inclusion in the sutures should give rise to unnecessary pain. I use buried sutures of floss silk boiled in soda solution, and take great care to avoid tying them too tightly. This is a very important point, neglect of which is largely responsible for the necrosis and suppuration which sometimes occurs. Floss silk becomes penetrated by leucocytes, and organised more readily than the hard twist. It is wise to bring together the margins of the ring in order to prevent any tendency to hernia. Three or four strands of silkworm gut are used as a drain, and removed in four days. Horsehair sutures close the skin incision. The patient is kept in bed for three weeks and lies on a sofa for another week, massage being employed to prevent debility.

---

* The best account which I have seen is by my friend, Dr. Cleghorn, in the October number of the *New Zealand Journal*.

It is very difficult to ascertain the subsequent history of patients, but I know two cases in which pregnancy, and labour attended by myself, left the uterus still in normal position. Of course, if the patient has not had a normal puerperium, she is as liable to displacement as if the operation had not been performed.

The indications for Alexander's operation are:

1. Retro-displacements in unmarried girls.
2. Retro-displacements which a pessary has failed to cure by pregnancy or otherwise.
3. In procidentia, without great enlargement of the uterus, as an auxiliary to plastic operations on the vagina.

The contra-indications are:

1. Enlargement and increased weight of the uterus.
2. Impaired mobility of the uterus, and oophoro-salpingitis, especially if the appendages are also prolapsed, and, even slightly, adherent in Douglass's pouch.

Of course the remarks made as to associated lesions of the pelvic floor and cervix, in connection with the use of pessaries, apply also to this method of treatment. Recently Dr. Polk has advocated the extension of Alexander's operation to cases where the appendages are adherent by means of a modification, which consists in opening the post vaginal vault, freeing the appendages and then shortening the round ligaments. I have not yet tried this procedure, but am inclined to think it is only applicable to cases of slight adhesion. Where the appendages are extensively disorganised I should still advise the last operation I intend to notice:

Abdominal Section, with ventro-fixation of the Uterus.—In my own practice I restrict this operation to retro-displacements with oophoro-salpingitis, in which the symptoms are serious—that is, where, in spite of pallative treatment by drugs, hot douching, glycerine tampons, and close attention to general hygiene, the patient is a constant sufferer, and totally unfitted for the enjoyments and duties of life.

With every care there is undoubted risk in this operation, and we should remember that many of these patients by the above palliative means can be made fairly comfortable. With regard to the technique I shall only say that in bad cases, where drainage is essential, it is not always necessary to do the ventro-fixation, the removal of the diseased and adherent appendages, and the altered relations produced by the drainage tube have proved sufficient in a number of cases, of which I have records, to maintain the uterus in position.

The sutures, which I use in ventro-fixation, are of silkworm gut, passed through all the layers of the parietes and through the fundus uteri, and removed in twenty-one days, the patient being kept in bed for another week, and not moving freely about until after the sixth week. It is a mistake to pass the sutures through the anterior wall of the uterus, as intra-abdominal pressure will then act prejudicially. Great care should be taken to scarify the fundus uteri and the parietal peritoneum, with which it comes in contact, so that firm adhesion shall take place between them.

Recently several German surgeons have strongly advocated for retro-deviations of the uterus—a new operation—anterior colpotomy with vaginal fixation of the uterus. I may hereafter alter my views, but at the present I consider this procedure is not to be recommended. The cases for which it is said to be particularly applicable—few or no adhesions—are just those in which Alexander's operation is most suitable, and the latter has the great advantage of being attended with much less risk, and of being much more scientific and rational. The uterus was never meant to be fixed anywhere, but to float and move freely amidst surrounding organs. The round ligaments are really prolongations of the uterus, and partake in its hypertrophy during pregnancy and subsequent involution. To take in the slack of these ligaments, therefore, while it corrects displacement, in no way alters natural conditions. It is evidently far otherwise with vaginal fixation, here one abnormal position is simply replaced by another.

In cases where vaginal fixation does not enter into competition with Alexander's operation—retro-displacements, complicated with adhesions and marked oophoro-salpingitis—I prefer ventri-fixation. In these cases, as a general rule, it is unwise to dispense with drainage, and no provision can be made for it in anterior colpotomy, unless Douglass's pouch be also opened, which would complicate the operation, and by the adhesions behind the uterus, produced by incision and drainage here, the organ would tend to be drawn back. All the operators, too, who have written in advocacy of anterior colpotomy admit that it must be resorted to with great caution when adhesions exist. Martin says, "In diseases of tubes and ovaries, when these are firmly adherent to the lateral or posterior ligaments of the small pelvis, it is quite unsuitable." Ventro-fixation has also the advantage that the adhesion which forms between the uterus and parietes in this operation more readily lengthens to allow of necessary uterine movement and enlargement than is the case in vaginal fixation.

In conclusion, gentlemen, I must apologise for the imperfections of this paper, and especially for the absence of my own statistics. Ill-health and over-pressure prevented my writing it in Sydney, and I have, therefore, had to put it together without opportunities for reference to authorities in the very few odd moments which the generous hospitality of our New Zealand *confréres* has left at our disposal. My hope is that it may prove sufficient to call forth a valuable discussion.

Dr. Rothwell Adam desired to express his gratitude for this important paper, the subject matter of which he must view as the opprobrium of gynecology. In the main he must agree with Dr. Worrall, and must confirm his remarks regarding the technique of Alexander's operation, of which he is distinctly in favour. As stated by Dr. Worrall it is not applicable to all cases of retro-displacement. So long as 17 years ago he had thought that this operation might be done by shortening the round ligaments, and he had then tried it in the *post mortem* room. The method he now adopted was Edebohl's modification of the Alexander-Adams' operation, where the canal is opened up for the greater part of its length, and the ligaments thoroughly freed. After sufficient has been drawn out to pull the uterus forward, the ligament is sutured into the canal by fine interrupted points of silk. By this method the canal is practically obliterated after the manner of operating for the radical cure of inguinal hernia. The skin wound is closed in the usual way with gut sutures. He did not use any drainage whatever. The sutures are removed in eight days, and there is union by the first intention. He then inserted a pessary which was worn for two or three months. He had done numbers of these cases, and the result was all that could be desired. In one young lady who took much exercise the result continued excellent. He could not say what was the result of after pregnancy in these cases, but so far as he had seen it was favourable. He had not practised ventro-fixation. It seemed this method brought the uterus entirely forward and out of its natural condition.

Dr. Miekle thought that many high authorities favour the use of suitable pessaries, and some condemn this operation, considering that the condition is likely to return, especially after a pregnancy. Pessaries may be, and are, worn without discomfort and with great benefit. Dr. Worrall did not refer to the value of prolonged rest in these cases. For his part he thought much of it, and instanced a case where perfect cure had resulted after six months rest.

Dr. Batchelor took great interest in these cases; there were so many important points involved. Perhaps there was no subject in gynecology that caused more disagreement among medical men, owing to the great differences of opinion and treatment. Recently he had seen a patient who wore a pessary but in whom there was a bad displacement. He suggested an operation, and this evoked a highly-indignant letter from the original medical attendant. In these colonies, he considered, we are much in advance of the Old Country in the treatment of this condition. There they generally let matters alone. What is the result in a properly selected case of Alexander's operation? Three weeks the patient lies in bed, and is then cured. The danger has been enormously overrated. If one has only operated two or three times it is likely that the operator might speak unfavourably of the operation, for there are at first some anatomical difficulties, such as finding the ligament, which is not always easily recognised. In one instance the peritoneum was cut into, the ligaments not found, and death resulted. As an anatomical point it should be remembered that the round ligament differs from the other uterine ligament in that it is striped muscular tissue at its external end. With regard to the so-called cure of retro-displacement by pregnancy, he had not seen any. In cases taken early he had seen cure follow rest and the pessary. But how rarely does one get these early cases? Six months ago he had reported the results of Alexander's operation sixty times, and without a failure, so far as he could find; then he had a case where he had stripped off the peritoneum too much, and it was probable he must again operate. In an early case operated upon by Dr. Maunsell the abdominal ring was opened up too much, hernia followed. For this condition he had operated, and it was interesting to find how firmly the round ligaments had reunited. He thought it better, in cases where adhesions existed, to open the abdominal cavity and perform hysteropexy.

Dr. Campbell took the view that the uterus is a lever held in place by its ligaments. It was important to get a proper pessary according to this view. Many used were very unsuitable. It was important to make careful measurement, and to use a flexible pessary, such as one of celluloid, which could be moulded by heat. He would exhibit one made by himself of wire. Dr. Worrall had not given the pessary sufficient credit. A suitable one keeps its position, but it should be examined from time to time. In enlargements from various causes it may be impossible to apply a suitable pessary; then, undoubtedly, operation should be undertaken. In cases of procidentia colporrhaphy should be done, but he had seen many failures of the operation in New York, where it had been devised.

Dr. Young emphasised the fact that operation should be done only in suitable and selected cases, and not, as was too often the fact, in almost every case that presented itself. There was a moral aspect of the question. Undoubtedly there was too much tinkering with pessaries.

Dr. Morton had seen many cases in various hospitals where Alexander's operation had been perfectly successful.

Dr. James considered that pessaries were valuable in recent cases, but of no value in those of old standing; in such, operation should be undertaken.

Dr. Garland said that one point had not been touched—the treatment of retro-displacement in virgins. Here pessaries would be most objectionable, and operation should be done. In other cases he would certainly try first the effect of a suitable pessary.

Dr. Cleghorn said that, like all those who have frequently performed the operation, his experience of it was most favourable. He had seen much harm result from the use of pessaries, especially those made of block tin, such as ulceration, &c. If used, the utmost discrimination should be practised in their use.

Dr. Worrall did not think that Dr. Adam's modification of the operation was at all necessary or an advantantage. Surely slitting up the inguinal canal added a danger of traumatism. He felt sure that the use of a pessary for three months after the operation, as used by Dr. Adam, was not necessary. If pessaries were of little use prior to operation, they could be of no more value after. The mortality is very favourable—not greater than after any other plastic operation. Pessaries, as everyone knows who removes them, are filthy instruments; besides, they may produce serious erosion. Dr. Mickle's six months rest for retro-displacement took a large slice from a woman's life. He agreed with the importance of Dr. Batchelor's reference to the anatomical character of the round ligaments. Pessaries made of block tin he considered the worst of all. But whatever form was used he was sure that the displacement, even if relieved, would recur on the removal of the support. He agreed with Dr. Garland in his remarks as to the inapplicability of pessaries in virgins.

THREE CASES OF BROAD LIGAMENT CYSTS.

By G. Rothwell Adam, M.B., C.M. Edin.,

Honorary Surgeon Women's Hospital, Melbourne.

The management of cysts of the broad ligament has always been a source of anxiety to the surgeon. The doctrine formerly held that a parovarian cyst, seeing that it was usually unilocular, was in a majority of cases curable by simple tapping, has now happily sunk into well merited oblivion.

The difficulties of operation are doubly enhanced when the cyst contents are purulent, and that this complication is not infrequent is well known to the abdominal surgeon. It is in such cases that the greatest difficulty arises, and our President, Dr. Batchelor, in a paper read before the British Gynecological Society, made the statement that although he had seen several such cases operated upon, both in America and England, most of them died, and that he had not yet seen a satisfactory method of dealing with them. This more especially applies to those that are of small size, so that the sack cannot be brought up to the abdominal wall, fixed there and drained.

The first of my cases was a young married woman without any family. She had consulted a medical man who, on examination, stated she had a displacement of the womb, and proceeded to replace it by means of a sound. The following day she had pain and was feverish, and which lasted for some time. Ultimately she was seen by another surgeon who, after the effused lymph had become absorbed, discovered a tumour. I then saw her with him, and found a distinct, somewhat elastic, tumour to the right of the uterus, and adherent to the broad ligament; the uterus being displaced to the left, but otherwise in a good position. Abdominal section was performed, and after separating a number of omental and intestinal adhesions, a round tumour was isolated within the broad ligament, and without a pedicle. By proceeding gently, the posterior layer of the ligament was scratched through, and a thin, walled, perfectly round cyst was enucleated. There was nothing by way of pedicle, and the tumour appeared to derive its sustenance from small vessels going to it from the connective tissue in which it was embedded. As no serious bleeding appeared from the cavity in the broad ligament, and when the tension was removed the walls collapsed and obliterated the cavity, no drain was inserted into the broad ligament; but, for precaution's sake, a glass tube was placed in Douglas's pouch. A considerable quantity of rather bright discharge was withdrawn from this tube for some days; but otherwise the patient made an uneventful recovery.

The second case was that of a married lady of thirty-five years of age, from whom, a year before, I had removed the uterine appendages for salpingitis of an untraceable origin, but probably gonorrheal. Her medical attendant referred her to me, on account of a swelling which appeared in the abdomen, and situated centrally. It was accompanied by irregular hæmorrhage, although she had not seen any discharge for six months after the previous operation. The tumour was hard, continuous with the uterus, and of limited mobility.

Owing to its apparent rapid growth, a suspicion of malignancy was raised, or at best it was hoped to be a soft œdematous myoma. On opening the abdomen a large hard tumour, apparently arising from the right cornu of the uterus, and opening up the right broad ligament, was discovered. This was assumed to be a myoma, and complete extirpation decided on. After separating some adhesions the tumour was raised, but, through the puncture made by the teeth of the large forceps, clear fluid escaped. But the thickness and muscular appearance of the walls led to the supposition the growth was of the fibrocystic variety. And it was not until the peritoneum had been opened up, for the purpose of evacuating the tumour, that it was discovered to be a broad ligament cyst.

The operation was completed by putting in a chain ligature through the broad ligament below the cyst, and then cutting it free. A considerable number of ligatures was required during the process of freeing it from the cornu of the uterus, which occupied considerable time. It is interesting to note that on the left side the stump left by the previous oophorectomy was seen as a slight elevation on the broad ligament, the only portion of the ligature remaining was the knot. That on the right side was not so easily made out, having been partially obliterated by the distension of the broad ligament, but, curiously enough, the ligature was found loose and intact. The patient made a good convalesence from this second operation, and enjoys good health.

The third case was that of a big stout lady, aged thirty-three, the mother of three children. She had suffered for some months from profuse menstrual discharge, lasting from ten to fourteen days, accompanied with considerable pain in the right ovarian region and general pelvic discomfort. For this her medical attendant curetted her, and after which she ran a temperature reaching on some occasions as high as 103 deg. Fah. There were no rigors. Two months after the curettage I saw her, and found her in a highly nervous state, with a tender, tumid abdomen, so that it was impossible to arrive at an accurate diagnosis. Accordingly she was removed to a private hospital and put under an anæsthetic, when a fluctuating tumour the size of a cocoanut was found occupying the right side of the pelvis. Abdominal section was performed, and a typical broad ligament cyst disclosed, with the normal tube lying on the top of it.

Two pints of thin pus were evacuated from the tumour before attempting enucleation, for the walls were so thin that it seemed impossible to do the manipulations without rupture. The process of enucleation was most difficult, and occupied a considerable time. After separating it as much as possible, a broad pedicle was obtained, made up partly of cyst wall, and broad ligament. A chain ligature secured this, and after the cyst was cut away, the stump was carefully cauterised. A drainage tube was placed in the cavity in the broad ligament, and the abdomen closed in the usual manner.

The patient made an excellent recovery, but the drainage tube had to be retained for a much longer period than usual, and after its withdrawal the temperature rose, so that a probe had to be passed down the track, and a small rubber tube inserted, which gave exit to a small amount of pus. At the time of writing this, although the tube has been done away with for many months, there is still a sinus down which a probe can be passed and felt, per vaginam, in the site of the stump. I am in hopes that the ligature will eventually come away and the sinus will close.

These three cases, although they all recovered, illustrate the difficulties of diagnosis and operation in broad ligament cysts. It might be worth while considering the advisability of attempting to get at them through the vagina, whereby drainage would be more easily secured, for there is always a danger of sinus remaining when a large number of ligatures is used, and the abdominal cavity has to be drained by the ordinary method.

[As this paper was forwarded after the close of the Congress there was no discussion upon it.—T. M. Hocken, Sec.]

CASE OF DERMOID CYST COINCIDENT WITH PREGNANCY.

By Robert Scott, M.B., ChM.,

Hon. Surgeon Ballarat Hospital.

The following case appeared to me of sufficient interest to warrant me in bringing it forward. E. G., aged 45, consulted me in November, 1893, complaining of pain in the hypogastrium, which was constant and accentuated during micturition. Micturition at this time was not more frequent than usual. She has had ten children, the youngest five months old and at breast. Was attended at her confinement by a mid-wife, and apparently made a good recovery. The pains only came on one month after the confinement. Previous health good. Urine examined at this time was quite normal. On examination per vaginam the uterus and appendages were healthy.

In the anterior fornix, directly in the mid line, was a tumor about the size of a large orange, and projecting towards the right side, hard and irregular, but not nodular; very slightly movable in any direction. On passing a sound into the uterus it was found to be quite detached from that organ. The bladder was healthy, but the tumor was intimately connected with it posteriorly.

Exploratory laparotomy was suggested, but the patient would not consent to any operation. She was seen by me again in December, when the conditions were much the same. Her general health was not so good, and she had been forced to wean the baby.

On the 28th January, 1894, during micturition, she heard something drop into the vessel, and on examination stated that she found the tooth which was shown to me. This was examined for me by a dentist, who stated that it was a temporary lateral incisor, such as would be developed at nine months. (Her baby was at this time eight and a-half months old, but had not cut any teeth.)

On 4th February, 1894, after consultation with Dr. Ochiltree, the patient was put under chloroform, the urethra was dilated, and the bladder was explored with the finger. No foreign body was present, and I could not detect any sinus in the wall. Towards the upper portion, and somewhat anteriorly, the mucous surface appeared eroded. The urine was very offensive, and she stated it had been so for about a week. It contained pus cells and blood, and was now passed five or six times during the day, and usually three times during the night. She developed an ischio-rectal abscess a few days later, which was opened, but did not appear to have any direct communication with the pelvic tumour.

On the 30th March she passed another temporary lateral tooth and several bony spicules, also a small ball of hair, which was such as is found in dermoid cysts. Patient able to go about, and had not so much pain during micturition. The urine was most offensive, the odour was noticeable as soon as one entered the house, although deodorants were freely used. The urine on standing threw down a purulent deposit stained with blood—about half its volume. The pelvic tumour had much decreased in size, and could only be detected bimanually on deep palpation. The patient's general health was wonderfully little affected, her appetite fairly good, and she got up every day and went about the house. Her complexion, however, was becoming very waxy; temperature normal, and she had never had any rigors. On the 9th May menstruation came on for the first time since her confinement.

During the next seven months her condition remained just the same. She would not consent to any operative measures, and latterly would not allow any vaginal examination, as stated it only gave her pain without doing any good. During this time she was taking tonics, with an anodyne to relieve pain, if severe.

18th February, 1895.—Yesterday she sent for me and stated she felt "a lump in the passage" which alarmed her.

To-day she was put under chloroform, and on examination a very large calculus was found extending fully half-way along the urethra. It was quite soft (phosphatic). An attempt was made to crush the stone and remove it, but after detaching a quantity of *débris*, the lithotrite came on some firm, hard substance, which appeared to be the nucleus. It was found impossible to remove this per urethram, and as the patient had not consented to any further operation, nothing more was done. The bladder was washed out with a warm boric solution.

24th February.—Patient rallied well from the operation. Urine was retained on the third day after the operation. *Débris* and some small pieces of bone had been passed. The pain in micturition had been considerably relieved.

Menstruation came on to-day. Temperature normal: no rigors.

On the 26th February, with the assistance of Drs. Ochiltree and Salmon, I performed suprapubic cystotomy. The consent of the patient was only obtained after she was fully convinced that it was the only chance of prolonging life.

Owing to the impossibility of dilating the bladder, and the thick layer of soft fat in the parietes, I experienced a good deal of trouble in reaching the bladder. On incising it, the walls were friable, and several times broke away when any tension was put on them. On inserting the finger I found the organ quite filled with a mass of soft, phosphatic calculus, and a small amount of most offensive urine. After removing a quantity of *débris*, I found a piece of bone firmly wedged across the bladder under the symphysis. Before removal could be effected, the bone had to be divided with bone forceps, and even then great care had to be exercised, as some of the edges were as sharp as needles. Lying under the bone were several teeth—molars and others.

All this *débris* having been cleared out, the bladder was washed out with a warm boric solution. The original tumour could not be detected, and seemed to have merged itself into the bladder wall, which latter consisted of soft granulation tissue, all semblance of mucous lining having disappeared. A tube was inserted, and the bladder wound left open.

Owing to the continued drain on the system, the patient only lived two days—dying from exhaustion. Unfortunately no *post mortem* examination could be obtained.

The amount of *débris* removed from the bladder at the operation was 96 grains. The large piece of bone was evidently a portion of the molar and superior maxilla, and contained several teeth firmly fixed in the alveolar.

Remarks.—I have termed this a "dermoid cyst" for want of more definite information. At the same time it appears to me quite possible that here one had to deal with an extra uterine gestation contemporary with the last pregnancy—but which became blighted about the third month, and then took on a dermoid character—producing hair and teeth. Owing to the absolute refusal of the patient to submit to operation in the earlier stage of the illness, it is extraordinary how she lived for fully twelve months without more definite symptoms of septicæmia from such a stinking suppuration. The place of attempted expulsion of the suppurating contents is also noteworthy. Pozzi states that spontaneous elimination of the suppurating sac (extra uterine fœtation) through the bladder is extremely rare, and Winckel has only been able to find twelve recorded cases of it. In such cases laparotomy, vaginal cystotomy, elytratomy and the supra-pubic operations have successfully been tried.

[This paper arrived too late to permit of discussion upon it.—T. M. Hocken, Sec.]

Dr. Jennings desired to ask the opinion of the section upon a point in which the interests of both the public and the profession were deeply concerned, and in which a medico-legal question was involved. He referred to the question of attendance on obstetric cases by a medical man who might happen to have under treatment a case of puerperal fever. He referred to a recent instance where this disease had undoubtedly been induced by the carelessness of a drunken nurse, and where the medical man in attendance had several midwifery engagements awaiting him. He moved the following resolution, which would sufficiently express his own views of treatment:—"That the prevention of the spread of puerperal fever by the temporary retirement from practice of the practitioner is unnecessary and uncertain in its results. On the other hand, a perfect system of disinfection of asepsis is as effective in this class of cases as in any other form of infectious disease." He thought the Congress should formulate some guide for the practitioner on this important point, which would not only be a direction, but would also afford a legal standpoint of the greatest use.

Dr. Batchelor unhesitatingly seconded the resolution, and said that a similar one had been carried at the Melbourne Congress.

Dr. Mickle supported the resolution, which was unanimously carried.

Dr. Campbell exhibited a pessary of block tin, covered with rubber, the ends being fluxed together. It was quite pliable, and he used it as a mould or model for making a harder instrument. He also exhibited a needle holder which was especially valuable for use in deep cavities. The handles and jaws fitted closely, and being electrolysed would attract the needle if by any mischance it broke or dropped. Both instruments were invented by himself. They were examined with interest by the members of the section who recognised the ingenuity displayed by Dr. Campbell.

This closed the business of the section.

Dr. Rothwell Adam, of Melbourne, then proposed a vote of thanks to Dr. Worrall, who had so ably presided over that important section in the absence of Dr. Way. The papers read, and the discussion upon them, had been of high value, and, if that were needed, abundantly testified to the immense advantage which accrued, not only to the profession, but also to the public, from such gatherings as that which was now so speedily to close. Dr. Worrall was well known throughout the colonies as an accomplished gynæcologist, and the section was to be congratulated, not only in having him as its President, but in listening to his criticisms upon the various papers presented.

Dr. Jennings, of Christchurch, seconded the resolution most heartily, and begged to endorse all that Dr. Adam had so well said upon the high-class character of the papers read before the section. Dr. Worrall had discharged his duties in the most capable manner, and the hearty thanks of the section were due to him.

Dr. Worrall gratefully acknowledged the way in which the resolution had been received. His sole regret was that Dr. Way had not been able to enjoy the honour which had been conferred upon himself. He was pleased to think that useful work had been done in the section. One of the special advantages of such meetings lay in the opportunity of learning the views and practice of those of large experience in the subjects introduced. As they had seen, opinions differed, and often widely, and it was only by free discussion and criticism, conducted in the friendly spirit, of which they had had an example, that *via recta* had been found. Again he offered his thanks for the courtesy extended to him, and declared the business of the section closed.

SECTION OF ANATOMY, PHYSIOLOGY, PATHOLOGY, AND PHARMACOLOGY.

PRESIDENT'S ADDRESS—THE STUDY OF ANATOMY AND PHYSIOLOGY.

By Dr. Watson, M.D., F.R.C.S.,

Professor of Anatomy, University of Adelaide.

Mr. President and Gentlemen,—

Allow me in the first place to return you my very cordial thanks for electing me President of this very important section. Any honour conferred by one's professional brethren I, in common with gentlemen occupying similar positions, appreciate very highly. It is not my intention at this late hour to occupy your time longer than is absolutely necessary. At this time of the year the mind of the hard-worked professional man naturally turns to thoughts of rest and relaxation. I may add that the gathering together of so many professional brethren from all parts of Australasia, in this hospitable and scientific focus of the most interesting country on the face of the globe must, apart from its scientific aims, tend to promote that social intercourse and brotherly love which should exist amongst the members of a learned profession such as ours. Our section, although low down on the list, includes those subjects upon which the basis of all scientific medicine must naturally rest. The whole fabric of clinical skill stands on a foundation of anatomy, physiology, and pathology, and they require for their comprehension a prior knowledge of the subsidiary sciences of physics, chemistry, and biology. The most profound knowledge of the above subjects as pure sciences does not by itself qualify a man for the conscientious practice of his profession. The teacher who only deals with anatomy as a pure science often fails to attach due value to those points which are important in the practice of medicine and surgery. Such a teacher attaches a high value to pure sciences as a means of cultivating the power of observation and stimulating and exercising the reflecting and reasoning faculties. We have heard the same thing said of dead languages, &c., so prone to create hopeless, helpless, exasperation in otherwise intellectual individuals not possessing a congenital bias towards their study. It goes without saying that, without ample practical experience, pure scientists cannot be satisfactory healers of the sick. As well might one expect a man to erect fortifications and build bridges, who, although he had gone through a course of mathematics and made himself familiar with trigonometry and the calculus, had not practised in the workshops. But it cannot be denied that our profession has undertaken the charge and patronage of a body of knowledge, only part of which has an application in practice. We do not study anatomy and physiology merely for the sake of pathology, or pathology merely for the sake of cure. For example: Physiology of the brain has been studied with a large amount of success in order to explain the ordinary operations of our mind. In fact, it might be said that psychology and the studies depending upon it are at present waiting on physiological investigation; and physiology is a pure science apart entirely from its application in medicine. And the same is true of pathology, which is an indispensable handmaid to physiology. If we were to require our students to study only so much physiology and pathology as are required for the recognition of the diseases they will be called on to treat, what would become of the studies of physiology and pathology themselves? The main thing in purely professional education is that the practitioner shall have a scientific interest in his work. This serves a double purpose, because in addition to it being the best guarantee for conscientious treatment, the interest in one's work becomes permanent because it is a scientific interest. This is too often overlooked. There is nothing we want so much as to have an abiding interest in our ordinary work, and it is only a scientific interest which can prevent it from becoming monotonous, stale, and unclean. Everyone ought to know that the good doctor has not only to possess the requisite knowledge, but to have an effective interest in his cases; and what interest can be so good for his patient as a scientific interest? The accompanying sympathetic interest is not acquired; it is cognate and instinctive rather than taught, and I hope we all have it without any training. What the doctor wants to know is the cause and the course of the disease. What does that mean but as intimate a knowledge as we can have of the normal and abnormal growth of tissues? A mere recognition of symptoms and a book of perscriptions added to a pleasant manner may make a student a financially successful practitioner, because unfortunately the general public cannot understand what more is required. But from an educational point of view, a doctor who confines himself to that is simply a legalised quack. What he ought to know is cause and effect, not signs and symptoms alone. The signs and symptoms are effects, and he ought to know their cause. Only then is his occupation a profession, and not a mere money-making investment of his life; only then does the patient have the best that we can do for him, both in point of knowledge and of interest in his case. At present the medical profession in every civilised country has undertaken the patronage of anatomy and physiology, and their patronage consists in requiring our students to study them. All professions which can claim to be learned professions are patrons of a learning which is not merely useful for money-getting, but whose value is as knowledge—mere knowledge; and what knowledge is of greater value than the knowledge of ourselves?

NOTES ON THE INNERVATION OF THE *MUSCULUS STERNALIS*, WITH REMARKS ON ITS MORPHOLOGY.

By J. T. Wilson, M.B. Edin.,

Professor of Anatomy, University of Sydney, N.S.W.

So much has now been written concerning the nerve supply of the sternalis muscle, that any further mere records of observations may seem superfluous. Nevertheless, in view of the extraordinary discrepancy between the results of observations on the nerve supply recorded by Professor D. J. Cunningham and other English observers, and those chronicled by Professor Bardeleben, of Jena, the enumeration of additional instances may ultimately aid in a more satisfactory settlement of a somewhat vexed question.

Briefly the case may be stated in the words of Professor Cunningham's last utterance on the subject, in his address to the section of anatomy and physiology at the meeting of the British Medical Association in 1891 (" Journal of Anatomy and Physiology," xxv., p. 31). He then pointed out that the nerve supply of the sternalis had been traced in forty-six cases by seven independent observers (English) to the thoracic nerves, and he accordingly maintained that this was the " constant and invariable " supply of the sternalis. He admits, indeed, that sometimes it may be associated with a minute twig from one or other of the intercostals, but " that it should ever constitute its sole nerve of supply, as Professor Bardeleben* asserts —more especially, as he states, in eleven consecutive cases—I simply cannot believe."

The only English observers who have recorded a purely intercostal nerve supply are Hallett, in one case quoted by Cunningham (*loc cit.*), and Dwight (" Journal of Anatomy and Physiology," xxii., p. 96), who found it in three cases, as against two which were supplied from the thoracic nerves. Indeed, Bardeleben's cases are the only other cases on record showing such a mode of innervation. Occasionally there has been found an intercostal nerve supply in addition to the ordinary anterior thoracic supply, as in two cases given by Shepherd (" Journal of Anatomy and Physiology," xxiii., p. 303) ; but in all the ten cases given by that writer the anterior thoracic nerve supply was present.

Even in the case of an apparent accessory supply from intercostal nerves, however, it is not always easy to be certain of its genuineness. The intercostal nerves frequently pierce or hook round the muscle, and mistakes may be easily made. Thus, in one case published by Birmingham (Trans. Roy. Acad. Med. Irel., 1889, p. 377), an apparent intercostal twig was seen to enter the muscle in addition to its ordinary thoracic supply, and even Professor Cunningham, on seeing it, was satisfied of its nervous character. On microscopical examination, however, this apparent twig was found to contain no nerve fibres at all.

***Anatomischer Anzeiger*, 1888, Nos. 11 and 12.

When all facts are considered it is impossible to avoid a conclusion with regard to Bardeleben's cases similar to that expressed by Cunningham. The intercostal nerves in these cases may have pierced the muscle, but certainly cannot, in every case, if in any at all, have formed the sole source of nerve fibres to the muscle.

The following cases may now be placed on record :—

1. Male adult subject; obese and rather decomposed, presents well developed double sternalis.

On left side the anterior cutaneous branch of the second intercostal nerve gave a twig to the muscle, but a long slender branch from the internal anterior thoracic nerve plainly formed its motor nerve of supply. On the right side the innervation was undetermined owing to the unfavourable conditions of dissection.

2. Chinese adult male subject. Right sternalis muscle continuous above with tendon of sternomastoid muscle, and also across middle line with fibres of opposite pectoralis major, which took their origin from it. The muscle was inserted below into a tendinous expansion, which for the most part covered the lowest sternal fibres of the pectoralis of the same side, but which also passed under cover of those fibres of the latter muscle arising from the aponeurosis of the external oblique muscle of the abdomen, with which it was indeed directly continuous.

The anterior cutaneous nerves of the second to the fifth intercostal spaces hooked round the inner border of the muscle, but gave no branches to it. The muscle was supplied by a long slender branch, traceable outwards for a long distance on the surface, and then through the substance of the pectoralis major to the surface of the pectoralis minor, which it pierced, and was found to arise from the loop between the external and internal anterior thoracic nerves.

3. Female adult subject. Right sternalis. This was a very small slip arising by a fine tendon from the front of the sternum opposite the attachment of the fifth costal cartilage. It was 7·5 cm. long, but only its middle third was muscular, forming a fleshy band about 4 mm. wide. This was innervated by a fine twig running inwards upon the surface of the pectoralis major from the anterior thoracic nerves. The anterior cutaneous brs. of intercostal nerves hooked round the inner border of the slip, but gave no filament to the muscle. The muscle was represented on the left side by a fine tendinous rudiment about 40 mm. in length and 1 mm. in breadth.

4. Adult female subject. Left sternalis muscle. This was joined by tendon to the sternomastoid muscle of the same side, and to the pectoralis major muscle of the opposite side. The anterior cutaneous termination of the second intercostal nerve pierced the upper part of the muscle, but gave off no twig of supply. The succeeding anterior cutaneous terminations of intercostal nerves came to the surface internal to its median border. Its nerve of supply was a very fine filament, which was traced outwards through the pectoralis major to a large branch of the external anterior thoracic nerve coming off that trunk, along with the branch to form the loop of communication between the two thoracic nerves.

5. Male adult subject. Right sternalis arose by narrow tendon 4 mm. wide from the sternal tendon of the sternomastoid. Widening as it descended, it passed at the same time slightly outwards and ended in a fleshy muscle, which rapidly increased in breadth to form a band 3 cm. in width above and 5·5 cm below over the cartilage of the fifth rib. It ended in the aponeurosis covering the external oblique muscle. Its mesial border gave attachment opposite the first intercostal space to fibres of the opposite pectoralis major.

The muscle was supplied by a fine nerve which entered its deep surface opposite the third intercostal space, and which was traced outwards on the surface of the pectoralis major, gradually sinking between its fibres to spring from the anterior thoracic nerves. None of the intercostal nerves whose anterior cutaneous twigs appeared at its inner border gave off any twig of supply to the muscles, or of communication with its proper nerve.

6. Female adult subject. Double sternalis; left side only examined. Nerve supply was traced to a long slender branch coming from the internal anterior thoracic nerve.

Thus, in every one of these cases the anterior thoracic supply was ascertained, and in only one was there an intercostal twig in addition. It is possible that the latter may have resembled the spurious twig found in one case by Birmingham (*loc. cit.*).

Much has been written concerning the morphology of the sternalis muscle. Its nerve supply, indeed, possesses importance only in relation to the more general question. I need not enumerate all the various views put forward—these, with the appropriate references to literature will be found in the papers of Turner,* Cunningham,† Windle,‡ and others.

More recently Mr. F. G. Parsons has discussed the problem in favour of the theory that the muscle in question is a remnant of the panniculus carnosus of mammals. Professor Cunningham is a strong advocate of the view (first put forward, as an explanation of a certain proportion of cases, by Bardeleben) that the sternalis "consists of some of the pectoral fibres rotated out of their usual position, so as to assume a direction more or less parallel to the long axis of the body." (Proceedings Anatomical Society, Great Britain and Ireland, February 1895, p. 13.) This view Cunningham has repeatedly expressed and supported by most weighty argument, and his view, I believe, may be said to hold the field at the present time. Due consideration of the anatomical conditions so often existent in anencephalous fœtuses (in which, as has been shown by Windle, the occurrence of a sternalis muscle is something like ten times more common than in the normally developed) tends, I think, to strengthen Cunningham's view of the homology of the muscle.

I cannot see that there is any substantial reason for preferring Mr. Parsons's view§ that the sternalis is "the remnant of a connection between the deep cervical and the deep abdominal panniculus," even if we admit the theoretical validity of such a view. For the nerve supply is admittedly consistent with either view, while the pectoral-fibre-rotation theory is supported by the established fact of the occurrence of a gap in the pectoral series of fibres frequently coincident with the presence of a sternalis—at least in anencephalous fœtuses (*c.f.*, Abraham, in "Trans. Roy. Acad. Med. Irel.," vol. i., 1883).

---

* "Journal of Anatomy and Physiology," vol. i., p. 246.

† "Journal of Anatomy and Physiology," vol. xviii., p. 208, and vol. xxii., p. 391.

‡ "Journal of Anatomy and Physiology," vol. xxvii., p. 348.

§ Morphology of the m. sternalis, "Journal of Anatomy and Physiology," vol. xxvii., p. 507.

Mr. Parsons does indeed seek to avoid a direct conflict between the two theories by means of his theory of the derivation of the pectoralis major from the panniculus. I cannot help thinking this to be a most unfortunate way of expressing a possible morphological relationship, and am surprised to find the view quoted approvingly by Professor Howes in a note in the recent translation of Wiedersheim's "Der Bau des Menschen, &c.," p. 113.

It appears to the present writer that the theory in question implies either nothing of any importance or too much. If what Mr. Parsons really means is that panniculus (in the thoracic region) and pectoralis major are alike derivatives of a common muscular stratum, which is the "superficial brachio-cephalic stratum" of Humphrey, then probably no one will dissent, because no new conception has been introduced; and one may then readily adopt Professor Cunningham's dictum that "it is impossible to draw a sharp line of demarcation between the muscular stratum known as the panniculus and the deeper layer of muscles" in this region. If, on the other hand, Mr. Parsons means to assert that—*first*, a panniculus stratum has been differentiated by superficial delamination from the undifferentiated brachio-cephalic mass, and that, *subsequently*, a portion of this panniculus has become converted into the pectoralis major, I do not think that such a view will at all commend itself to other students of comparative myology.

Arguments based solely upon the conditions obtaining within the mammalian class are of little use for the purpose of establishing such a fundamental genetic relationship as that put forward by Mr. Parsons; and a reference to the arrangements in the submammalian groups* readily shows how little ground there is for regarding the pectoralis major as a derivative of the panniculus. On the contrary, there is considerable justification for regarding the panniculus as morphologically a more recent product of muscular segmentation than is the pectoralis major. The panniculus is almost entirely absent in fishes, and is only very weakly developed in amphibia where the pectoral system is highly differentiated, and in many reptiles a similar condition of the skin muscle is present, while the pectoralis major is well developed and directly continuous posteriorly with the rectus abdominis.

I know of no other considerations which entitle us to regard the pectoralis major of submammalian groups as other than the homologue of that of mammals; and if this be so I do not see that on the strength of the argument derived from the condition in rodents we can harbour a theory which has absolutely nothing to support it when applied to lower and presumably more primitive forms.

---

* *C.f.*, *e.g.*, Rüdinger's classical monograph, *Die Muskeln der Vorderen Extremitäten der Reptilien und Vögel*, Haarlem, 1868.

Mr. Parsons's difficulty in otherwise interpreting the complicated relation of panniculus to pectoralis major in rodents may perhaps be obviated in quite another fashion, by supposing—*e.g.*, that in the differentiation of deep slips of the "panniculus" what really occurs is the segregation of groups of what are really pectoral fibres, and their union or fusion superficially with the more genuine panniculus fibres delaminated from the surface of the brachiocephalic stratum, thus forming a more or less distinct functional muscular mechanism. That in a highly modified functional organisation such associations and dissociations of groups of muscular fibres do occur, a study, say of the shoulder and arm muscles of the European mole, will show.

But whatever other explanation may be adopted it is, in the opinion of the writer, a profound mistake to regard the pectoralis major as a derivative of the panniculus carnosus.

NOTES ON THE STEPHANION AND ON VARIOUS DESCRIPTIONS OF THE TEMPORAL LINES OF THE SKULL.

By J. T. Wilson, M.B. Edin.,

Professor of Anatomy, University of Sydney, New South Wales.

In a paper on the "Craniometry of the Punjab Tribes," which was published in the "Journal of Anatomy and Physiology" for October, 1892, Professor R. Havelock Charles makes reference to the arrangement of the temporal lines of the skull and to the position of the stephanion. He criticises the definition of the latter point as ambiguous, on account of the duplicity of the temporal crest at its intersection with the coronal suture. I believe, however, that a consideration of the literature in reference to the point in question will enable one definitely to identify the true stephanic point—*i.e.* for purposes of measurement—as the intersection of the coronal suture with the lower temporal line, and not with the upper, as Professor Charles has regarded it.

We owe the term "stephanion" to Broca, who, in his "Instructions Craniologiques" (p. 31), defines it simply as the place where the "temporal line" cuts the coronal suture obliquely. Further on, however, (p. 67) he gives the following explanation:—

"Le stéphanion ne constitue pas un point unique; c'est la partie de la suture coronale qui correspond au passage de la ligne temporale et à l'insertion supérieure du muscle temporal et de son aponéurose. Cette partie, remarquable par la plus grande complication de la suture, occupe, sur la suture coronale, une étendue d'environ 2 centimètres; audessous d'elle, brusquement, la suture devient très-simple et presque linéaire, pour descendre, vers le pterion. Le compas doit être placé sur le point où s'effectue ce brusque changement dans l'état de la suture."

Thus we see that the stephanion in the original sense is not a point but a sutural region like the pterion. The measurement point, however, as above defined by Broca, may be called the lower stephanic point, for it will be found that it is precisely at the intersection of the coronal suture with the lower temporal line that that abrupt change in sutural character occurs to which Broca refers in the authoritative statement just quoted.

Professor Charles is thus in error in measuring the bistephanic diameter between the points of intersection of the coronal suture with the *superior* temporal lines of the skull.

In 1887, Professor Victor Horsley in writing on Craniocerebral Topography ("American Journal of Medical Science," April, 1887), recognising a bifurcation of the temporal crest of the frontal bone behind the external angular process of the frontal and in front of the coronal suture, explicitly identifies the stephanion with the intersection of the lower ridge and the coronal suture.

The apparent ambiguity to which Charles has drawn attention is, nevertheless, worthy of some further notice. I think it is not improbable that when Broca introduced the term "stephanion" he really meant it to be regarded as a definite point and not as a region, and that only subsequently did he feel the necessity for further determining a stephanic point of measurement on realising that his definition of the stephanion included a sutural region irreducible to a single point.

In the text books of osteology at the present day the stephanion is still commonly defined as a point, and this imperfect definition is dependent upon a defective recognition of the details of the topography of the temporal region of the skull. It is very strange that in no English text book I have examined is the description of this region free from vagueness, while several of the accounts given are extremely incomplete and misleading.

The uncertainty of description chiefly affects the temporal crest and lines. Thus, Humphry ("The Human Skeleton," 1858) merely speaks of "a ridge bounding the temporal fossa, crossing the frontal, the parietal, and temporal bones, and reaching the mastoid process of the latter.

Both Wagstaffe (1875) and Ward (1876) in their "Manuals of Osteology" refer to the temporal ridge merely as a single line. In the short sketch of osteology in his "Introduction to Human Anatomy" (Ed. 1882), Turner recognises its double character in the phrase "the curved temporal ridge usually double." In Holden's "Osteology" (Ed. 1887) we read of "a curved line, the temporal ridge. In well-marked skulls this ridge is double, showing an upper and a lower line separated from one another posteriorly by about the distance of half an inch but coming nearer together in front. . . . The point where the temporal ridge becomes continuous with the anterior border of the (parietal) bone we call the stephanion" (p. 46).

In Gray's "Anatomy" (Ed. 18) we merely read of "the temporal ridge," while even in Macalister's important and scientific text book the description, though more ample, is yet unsatisfactory. This author says: "A projecting arched line, the temporal crest, descends backwards (from the external angular process), crossing the coronal suture at a point called the stephanion, and marking off the lower and outer part of the frontal, and the lower third of the parietal. This crest descends steeply behind to the notch in the back of the temporal bone at the front end of the parieto-mastoid suture, and then turns forward horizontally above the ear passage. This line is generally double, and more prominent anteriorly, single and fainter behind. The area below it is smooth, and is called the temporal fossa. The bone above it is dotted with minute vascular holes."

In the tenth edition of Quain's "Anatomy" (Vol. II., pt. I., 1890), there is given a much more detailed description than appears in the previous editions. Here we read that, "passing through or close below the parietal eminence are the superior and inferior temporal lines, enclosing between them a narrow curved portion of the surface, which is usually smoother and more polished than the rest." Again (on p. 37), "The temporal crest springs from the external angular process, and arches upwards and backwards, to be continued into the temporal lines of the parietal bone." And on page 64, "The temporal fossa . . . is bounded above by the temporal crest of the frontal bone and the lower temporal line of the parietal. The latter turns down posteriorly to join the supra-mastoid crest of the temporal bone, which in front is continued into the upper edge of the zygomatic arch. Along this line of bone is attached the temporal fascia, which in the complete state roofs in the temporal fossa." But in fig. 67, taken from the older edition (after Allen Thomson), representing the norma lateralis, the "temporal ridge is represented by the superior temporal line alone, and the backward prolongation of the latter, which is not referred to in the text, is indicated as approaching the lambdoid suture at some distance from the asterion.

Perhaps the best text book representation of the topography of the temporal region of the skull is to be found in fig. 83 of Morris' "Treatise on Human Anatomy" (1893), although the associated textual description is not at all a detailed one. Still, from the figure alone one might learn that the two lines abut separately upon the coronal suture, and that they diverge somewhat from one another as they are traced back, the lower curving sharply downwards to join the hinder end of the supra-mastoid ridge, while the upper, also turning downwards further back, appears to cross the parieto-mastoid suture a very short distance in front of the asterion. Such a condition is undoubtedly to be found in a number of skulls in which the duplicity of the so-called "temporal ridge" is well marked, and which, therefore, are to be regarded as presenting a more typical configuration than those skulls in which one or other of the temporal lines is suppressed, as is occasionally the case. Had the facts brought out by Morris' figure been generally current in the text book descriptions the present note would not have originated. The unsatisfactoriness of the ordinary descriptions was impressed upon me, prior to the appearance of Professor Charles' paper, during the examination of a series of skulls of Australian aborigines. In these I observed features in the disposition of the temporal lines precisely similar to those described by Charles as occurring in Punjabi skulls (*loc. cit.* pp. 7-8), and which may be thus shortly summed up: The temporal crest of the frontal bone constantly bifurcates a short distance behind the external angular process, and from 20 to 30 mm. in front of the coronal suture. The two resulting lines intersect the coronal suture quite separately from each other (often as much as 25 mm. intervening between the points of intersection), and they arch backwards over the parietal bone separated by a considerable interval, which widens by a gradual further divergence of the lines. The upper line usually ends posteriorly by abutment upon the lambdoid suture at a point considerably (30 to 40 mm.) above the asterion. The lower line sweeps sharply downwards towards the parietal notch of the temporal bone, and ends by becoming continuous with the posterior end of the supra-mastoid ridge through which it is continuous with the posterior or horizontal root of the zygoma. There is thus included between the two temporal lines posteriorly a wide triangular area limited behind by the lower portion of the lambdoid suture. This area is quite smooth, dotted with minute foramina, and it is as a rule somewhat elevated. A comparison of the above account with that given by Broca (*loc. cit.* pp. 29-30) regarding the topography of the temporal region elicits several points of divergence. These relate to the modes of commencement and termination of the temporal lines, anteriorly and posteriorly, respectively. According to the above-named distinguished authority the temporal crest of the frontal bone is single, "et va aboutir à la suture coronale sur le point appelé stéphanion." The temporal crest of the frontal is the most anterior portion of the whole "ligne latérale du crâne," while the parietal portion of this same "ligne latérale" constitutes "la ligne temporale supérieure du pariétal," which commences "sur le stéphanion où aboutit d'autre part la crête temporale du frontal, se relève assez brusquement derrière la suture coronale, dont elle se détache, &c."

But the inferior temporal line of the parietal is also held to begin at the stephanion—"Elle commence, comme la premiere, sur la stéphanion, et comme elle, elle fait suite à la crête frontal, dont elle continue la direction; en d'autre termes, la crête frontale, parvenue sur le stephanion, se dedouble pour former sur le pariétal les deux lignes temporales." Again, according to the same author, the superior temporal line turns down posteriorly to end at the asterion, instead of at the lambdoid suture, at a point remote from the asterion by about 30 to 40 mm., as I have found it. (*c.f.*, Broca's, plate I., fig. I. *loc. cit.*, and Morris, fig. 83.)

While inquiring into these discrepancies I came upon Hyrtl's paper, "Die doppelten Schläfelinien der Menschenschädel" (Denkschriften d.k. Akad. d. Wissensch. Wien, 1872)—a paper which has exercised only a very tardy and insufficient influence upon the text book descriptions of the temporal region.

In this little-known paper Hyrtl shows that, in the great majority of cases, both temporal lines are present; that they arise by a bifurcation of the temporal crest of the frontal in front of the coronal suture; that the superior temporal line ends posteriorly in the lambdoid region, whilst the inferior curves down to join the posterior root of the zygoma (its supra-mastoid continuation). The intervening space between the two temporal lines Hyrtl describes as sickle shaped, but he points out that if, as is sometimes the case, the upper line is only recognisable behind the coronal suture, the tip of the sickle may be lacking. This latter condition is doubtless that which Broca has taken to be typical (*vide* his figure above-mentioned), but his description of something in the shape of a bifurcation behind the coronal suture cannot be held good.

Morris' fig., already referred to, on the whole approximates to Broca's description, though I infer from the text that a precoronal bifurcation is held to be present. A study of skulls with well-marked features like those of Australian aborigines leads to the conviction that the ending of the superior temporal line in or at the lambdoid suture is the more typical mode. This is confirmed not only by Hyrtl's descriptions but by other authors who have given a similar account of the arrangement of the temporal lines—*e.g.*, J. W. Spengel, in "Journ. Mus. Godeffroy" Bd. IV, and Von Jhering. Die Schläfelinien des Menschlichen Schädels, in "Arch. f. Anat. u. Physiol.," 1875, p. 67. The latter author entirely confirms Hyrtl's statements, and sums up certain further results of his own observations partly to the following effect: —The relation of the two (temporal) lines yields no constant racial factor. Neither the intra-parietal suture nor the line of angular curvature of the cranial surface stand in any constant or causal relation to the upper line. The lines on the human skull answer exactly to those of the skulls of anthropoid apes.

NOTES ON THE OLFACTORY CENTRE.

By G. Elliot Smith, M.D., Ch.M. Syd.,

Demonstrator of Anatomy, University of Sydney.

Among most vertebrates the sense of smell attains an importance at once peculiar and unique, which presents a striking contrast to the apparently unimportant and insignificant rôle which it plays in the highest mammal. The human olfactory apparatus, as the organ of the most subordinate of the senses, represents but "the ruins of a former greatness," which is seen at its full in lowly mammals, in which the sense of smell has an extremely well-marked physiological predominance over the other senses, and occupies a peculiar psychological position, which has been emphasised (in the case of mammals) by Broca,* and more recently by Edinger,† among others. Corresponding to these remarkable physiological and psychological characters, the anatomy of the olfactory apparatus presents many peculiar features. For the nerves of smell establish a direct insertion into part of the hemisphere itself, and, until quite late in the phyletic scale, maintain a much more intimate and extensive connection with the cortex cerebri than any other apparatus. Not only so, but the areas which are definitely associated with the olfactory tracts, constitute a markedly predominating part of the cortex cerebri in all except the higher mammals.

In the mammalia an area of cortex first becomes definitely set apart, which does not present that intimate relationship to the smell apparatus which the earlier cortex presents. This newer (*i.e.*, more recently differentiated) cortex becomes anatomically connected with other sensory mechanisms—visual, acoustic, and tactile—and corresponds to the pallium of Sir William Turner.‡

---

* "Bull. de la Soc. d'Anthropologie," 1878, t. xiii.

† The Significance of the Cortex, &c., "Journ. Comp. Neurology," vol. III., p. 69.

‡ "Journal of Anatomy and Physiology," vol. xxv., October, 1890.

In the mammalian brain each cerebral hemisphere may be definitely divided into three regions; (*a*) an area associated (not necessarily exclusively) with the smell apparatus—the rhinencephalon of Turner*; (*b*) the rest of the cortex cerebri—the pallium; and (*c*) the corpus striatum, which is the remains of the parent mass of the hemisphere.

The insertion of the olfactory nerves into the dorsal part of the anterior extremity of the lateral wall of the neural axis (according to His the "Flügelplatte") appears to determine that region as the cerebral hemisphere. An attentive study of the comparative anatomy of this region in lowly vertebrates—especially fishes—and of its development in mammals † indicates that the primitive corpus striatum forms the lateral wall of the median canal of the neural axis In the light of our knowledge of phylogeny this signifies that the hemisphere is essentially a thickening of the dorsal part of the lateral wall of the medullary tube, as Studnicka ‡ has pointed out. This thickening is the axial ganglion (the so-called corpus striatum), and from it the cortex becomes differentiated, § forming the sac-like outgrowth, which is the hemisphere vesicle. The first cortical areas to become thus segregated all belong to the rhinencephalon, whose evolution may be traced throughout the Ichthyopsida and Sauropsida to reach the height of its morphological importance and historical differentiation in the lower mammals. Among higher mammals its importance wanes, owing to the fact that the rhinencephalon becomes subservient to the pallium, which also appears to be derived from the same primitive thickening or axial ganglion. The pallium would appear to become first differentiated from the parent mass in reptiles. What is left of the axial ganglion (after rhinencephalon and pallium are formed) constitutes the true corpus striatum. In the lowest stage of mammalian organisation the pallium is still insignificant—as compared to the rhinencephalon, whose size is determined to a large extent by the development of the olfactory apparatus—but it rapidly increases in extent, and soon throws the rhinencephalon into a position of comparative obscurity. In most mammals the pallium thus comes to form the great bulk of the hemisphere. When one recollects that the pallium is only doubtfully recognisable at all in the reptile brain, the necessity for insisting upon extreme caution in comparing mammal and reptile ought to be forcibly impressed upon the comparative anatomist. Yet the latter but too often rashly and superficially compare the two types of hemisphere, as though regions which correspond topographically were both homoplastic and homodynamous—were in fact strictly homologous. I need only refer the reader to the voluminous literature relating to the morphology of the so-called corpus callosum of lower vertebrates for abundant evidence of such superficial and illusory comparisons, which have been instituted with a *naiveté* and credulity which are not often found in scientific literature—even of the most speculative type.

---

* The rhinencephalon certainly fulfils other functions than that of a smell centre, since parts of it exist in anosmatic cetaceans. If we use this term, therefore, we will be met by the paradoxical statement that smell-less animals still possess a "smell brain." Partly for this reason I have called the rhinencephalon of Turner the "true limbic lobe" in the "Journal of Anatomy and Physiology," vol. xxx., part 1.

† The appearance of the developing cerebrum in ornithorhynchus—the lowest mammal—agrees so closely with Professor His' account of the developing human brain that the early stages of the growing hemisphere may be assumed to present uniform features throughout the mammalia.

‡ "Anatomischer Anzeiger," vol. xi., No. 10, February, 1894.

§ Edinger (*loc. cit.*) speaks of cortex as being "added." This term can only be used in the same sense as one would speak of the mesoderm being "added" to a bilaminar blastoderm.

So great is the pallial growth in mammals, that a re-arrangement of the commissural fibres of the hemisphere becomes necessary—a large strand of fibres connecting the dorsal region of the pallium taking a more direct (supraventricular) course as the dorsal commissure of the pallium or true corpus callosum.

This increase in the size of the pallium, unlike that of the rhinencephalon, is not directly related to the degree of development of any sensory apparatus. But the increase at the same time implies an increasing psychological importance of the other (non-olfactory) senses, whose nerve paths establish connections with the pallium. Among sub-mammalia the highest end-station of these sense organs would appear to be the axial ganglion (so-called corpus striatum); but their physiological importance is increased in the mammalia by the extension of a pallium from this axial ganglion, thus procuring a cortical representation for the other senses. This may presumably be taken to imply that as the complexity of the mammalian organism increases, visual, acoustic, and tactile impressions attain to a degree of psychological importance which they lacked before.

With the increasing share which sensations, other than olfactory, take in psychical phenomena, the importance of the sense of smell diminishes, so that a highly developed rhinencephalon becomes superfluous. The degeneratiou of these superfluous parts becomes a condition of progress—*i.e.*, the further growth and differentiation of the pallium. Hence in the primates retrogressive changes occur in the olfactory apparatus, and the pallium attains that enormous development, which is the great distinguishing feature of the highest order in the animal kingdom.

The main factors in this retrogression in the rhinencephalon will now be briefly considered, with special reference to the human cerebrum.

I have already referred to the fact that the olfactory nerves present marked peculiarities, maintaining a primitive simplicity of form which no other sensory apparatus retains among the vertebrata, and whose analogues are found in the general sensory nerves in such lowly invertebrates as lumbricus, which have been described by Lenhossèk and Retzius among others. This peculiar retention of such an ancestral type may point to the extremely early specialisation of the most cephalic sensory nerves to undertake the olfactory function. Thus the olfactory nerves, arising from nerve cells situated in the mucous membrane of the nasal cavity, terminate in the olfactory bulb in the olfactory ganglion (His), which is a derivative of the same olfactory plate (ectoderm) from which the nerves themselves arose. The axis-cylinder processes of the cells in this ganglion—which corresponds to the perŏ of Burt Wilder—enter the cerebrum directly. This peculiar and significant disposition distinguishes the olfactory from all other sensory nerves, and is suggestive of the peculiar physiological significance of the sense of smell.

In the lowest stage of mammalian brain-organisation the greater part of the surface of the hemisphere belongs to the rhinencephalon. Hence it is that the study of the hemisphere in such forms practically resolves itself into an examination of the smell apparatus. But as the pallium increases in extent the rhinencephalon becomes reduced to a ring of grey matter surrounding the "hilum" of each hemisphere, and which I have called the "true limbic lobe."* The relatively diminutive size, and the disturbed relations, render it difficult to recognise in the human brain this annular arrangement, which is so obvious in the marsupial. As I have described† the principal changes which take place in this evolution, it will only be necessary to briefly indicate them here.

The greatest disturbing factor is the appearance of the dorsal commissure of the pallium, or true corpus callosum. This developes in the lamina terminalis (which becomes greatly altered to form the septum pellucidum) within the ring of the rhinencephalon, and rapidly extends in a longitudinal (antero-posterior) direction. As a direct result of this the dorsal part (of the Metatherian hippocampus), which would lie above the corpus callosum, becomes enormously stretched, and undergoes retrogressive changes to form in higher mammals (Eutheria)—an insignificant grey band lying on the corpus callosum. This is the gyrus supracallosus of Zuckerkandl, and represents the dorsal part of the rhinencephalon. Anteriorly, it may be traced round the genu of the corpus callosum, as the gyrus geniculi to become continuous with a vertical strip of grey matter lying just in front of the anterior commissure. This is the mesial or upper part of the gyrus subcallosus of Zuckerkandl (the pedunculus corporis callosi of Vicq-d-Azyr, or pedunculus septi pellucidi of many German writers). For reasons explained at length in a number of papers‡ I have distinguished this region as the precommissural area. On tracing the gyrus supracallosus posteriorly, it will be found to round the splenium of the corpus callosum, and becomes continuous with the hippocampus,§ which extends from the splenium downwards and forwards towards the tip of the temporo sphenoidal lobe. Lying behind and below the hippocampal fissure is the gyrus uncinatus (seu hippocampi). The anterior and lower part of this forms the posterior extremity of the pyriform lobe of lower mammals. On tracing it forwards it extends through the depths of the valleculla sylvii, and its anterior degenerated extremity forms the lateral limit of the locus perforatus anticus, its situation being indicated by a narrow white strand—the so-called lateral olfactory root. In most mammals this pyriform lobe is bounded on either side of a well-marked fissure—f. ecto and f. endo-rhinalis respectively. With the atrophy of the pyriform these fissures vanish, the remnant of the f. ecto-rhinalis being seen in the collateral fissure of man.

The locus perforatus anticus of Vicq-d-Azyr is in man a degenerate region, which contains representatives of several areas which are quite distinct in lower mammals. Thus, in all macrosmatic mammals the anterior part of this area forms a prominent boss of grey matter—the tuberculum olfactorium, which consists of a well-developed cortex capping the head of the corpus striatum. Behind this there is a flat area, which is the true perforated spot—substantia cinerea anterior of Ganser,* portio depressa of Burt Wilder. This forms the basal part of Zuckerkandl's gyrus subcallosus. The lateral part of the anterior perforated spot is formed by the degenerated remains of the pyriform lobe, whose position is indicated by the narrow, white strand formed by the external olfactory radiation.

---

* "Journal of Anatomy and Physiology," vol. xxx., 1895, p. 157.

† *Loc. cit.*

‡ *Loc. cit.;* also "Anat., Anz.," Bd. x., Nt. 15. "Proceedings of Linnean Society of New South Wales," vol. ix., pt. 4.

§ "J. Anat. and Phys.," vol. xxx., p. 162, fig. 5.

Olfactory Tracts.—The first stage of the olfactory path is formed by the olfactory nerves proper, which, arising in cells in the mucous membrane of the nose, conduct impulses to the olfactory bulb, where the nerves terminate.

The second stage is formed by medullated fibres arising in the bulb and terminating in various regions of the cerebrum. These fibres have been variously described as "roots," "nerves," "tracts," by various writers, but have recently been more accurately distinguished as olfactory radiations (Riechstrahlung) by Edinger.†

The different radiations have had a perplexing variety of names attached to them by different writers; and this confusion is further aggravated since the same name is in many cases applied to very different fibre bundles by different writers. Thus the term "internal root," or its equivalent, is used in quite different senses by Broca, Edinger, Herrick, and Kölliker, among many others, and Obersteiner even denies the presence of such a "root."

In order to avoid the confusion which the use of such terms would necessarily involve, I will use purely descriptive terms in this account.

The great bulk of the fibres constituting the "radiations" proceed to the pyriform lobe (part of the gyrus uncinatus) and the region of the nucleus amygdalæ, and may be distinguished as the tract to the pyriform. It corresponds roughly to the external or lateral olfactory radiation.

A large number of fibres go to the tuberculum olfactorium, and may be called the tract to the tuberculum olfactorium. In most animals they are derived from the so-called external radiation. But Kölliker‡ and Calleja§ would call them the internal, or mesial radiation.

A third series of fibres proceed to the precommissural area, to proceed indirectly, and probably also in part directly, to the hippocampus. These may be called the tract to the precommissural area.

These three series of fibres, or tracts, are indistinctly separated from one another, and are only to be distinguished by their destination. Thus the external radiation includes (in all mammals except monotremes) not only fibres to the pyriform, but also to the tuberculum olfactorium.

Each part of the rhinencephalon is connected to the corresponding region of the other side by means of commissural fibres. Thus the hippocampus, including the fascia dentata, has its own commissure (hippocampal or fornix commissure, lyra, psalterium). The precommissural area also has its own commissure, which in marsupials, monotremes, reptiles, and amphibia, crosses the middle line with the fibres of the hippocampal commissure, but in higher mammals is separated from the hippocampal fibres by the dorsal commissure of the pallium (true corpus callosum) and forms part of the commissura baseos alba of Henle (commissura pedunculorum septi of Reichart), which His considers* part of the corpus callosum.

---

* Gehirn des Maulwurfs.—"Morph: Jahrbuch," Bd. vii., 1882.
† Riechapparat und Ammonshorn.—"Anat. Anz.," viii., 10, 11.
‡ Ueber den Fornix, &c.—"Verhandl. Anat. Gesellsch.," 1894, p. 45.
§ "La region olfactoria."—Madrid, 1893.

The two series of fibres (fibres connecting precommissural area and fibres connecting pallium) present such a marked contrast in their phylogenetic history and their morphological arrangement that any system of classification which groups them together simply creates a heterogeneous jumble, which can only be a stumbling block to future workers. If one follows His and calls this commissure corpus callosum it follows that a corpus callosum—in this confusing sense—exists in submammalia. The futility of such an admission I have frequently pointed out elsewhere.

All other regions of the rhinencephalon are connected to parts of the opposite hemisphere by means of the anterior commissure.

The fibres of the tract to the precommissural area reach the superficial parts of the fascia dentata and hippocampus either directly (bundle of fascia dentata) or after being interrupted in the precommissural area. The course which they take is probably partly through the supracallosal gyrus, in the stria medialis Lancisii), and partly through the septum pellucidum to the fornix and fornix longus.

Fibres springing from the cortex of the tuberculum olfactorium proceed upwards above the anterior commissure to enter the fornix and proceed to the hippocampus *via* the alveus.

The fornix therefore forms an integral part of the system of olfactory tracts. Various meanings have been attached to the word fornix, as applied to brain anatomy. In this paper it is applied to all those hippocampal association fibres which pass through the alveus in some part of their course.

The hippocampus is one of the most important parts of the smell centre, although it is at present impossible to say what its exact function may be. The function of the fascia dentata is wholly related to smell, since it only disappears in anosmatic animals (certain cetacea). But the hippocampus major, although largely olfactory in function, is not wholly so. For it does not vary proportionately with the smell apparatus,† and does not wholly disappear in anosmatic animals. Corresponding to this persistence of part of the hippocampus there is fornix, which must also be non-olfactory.

The pyriform lobe is directly connected with the olfactory bulb and varies in size directly with that of the bulb, yet it appears to be present in a not wholly degenerate condition in anosmatic cetacea. If so, it must fulfil some other function in addition to that of smell.

The cortex which constitutes the tuberculum olfactorium is probably purely olfactory in function.

---

* "Arch. für Anat. u. Phys.," 1895; "Anat. Abth. Supplement-Band," p. 173.

† The Cerebrum of Notoryctes typhlops.—"Proceedings of Royal Society of South Australia," 1895.

The bundle of fibres which Zuckerkandl has called the "Riechbundel des Cornu Ammonis," is presumably supposed to be part of the smell apparatus. Yet one is only justified in connecting that small part of the bundle going to the olfactory peduncle and tuberculum olfactorium with the sense of smell. For the bulk of the bundle—which passes from the precommissural area across the vallecula Sylvii to the region of the nucleus amygdalæ—is present in an extremely well-developed form in the porpoise—an anosmatic cetacean. Some of the fibres of this bundle pass into the mesial stria of Lancisius, which therefore is largely non-olfactory. This prepares one for the fact that the gyrus supracallosus does not vary directly with that of the smell apparatus, in spite of the conflicting statements of Jastrowicz, Valentin, Hill, and Fish, among others. Those parts of the olfactory tracts which do not belong to the cerebral hemisphere, do not come within the scope of this paper.

The above account is in many parts vague and fragmentary, but I hope soon to have ready a fuller and more detailed account based upon a series of experimental degenerations which have been produced in the rhinencephalon of the bandicoot (Perameles nasuta).

THE HISTOLOGY OF TWENTY-NINE CASES OF PRIMARY NEOPLASMS IN THE KIDNEY.

By H. B. Allen, M.D.,

Professor of Anatomy and Pathology in the University of Melbourne,
and Pathologist to the Melbourne Hospital;

And T. Cherry, M.D., M.S.,

Demonstrator and Assistant Lecturer in Pathology in the
University of Melbourne.

The pathology of tumours of the kidney is avowedly very obscure. There is no general agreement whether the infecting forms should be classified among sarcomata or carcinomata. Various opinions are expressed concerning renal adenomata, many authorities holding that they may be arranged in two series—one springing from the tubes of the kidney, the other from some inclusion of tissue properly pertaining to the adrenals or to the Wolffian body. These, and other divergences of interpretation, issue partly from our imperfect knowledge of the embryology of the kidney, especially as regards the origin of the tubular epithelium. The fundamental question is—Whether this epithelium is epiblastic, and thus capable of producing true carcinoma, or mesoblastic, and thus apt to take part in the evolution of sarcoma. It is usually stated that the epithelium of the straight tubes is epiblastic, and derived from that of the Wolffian duct, whereas that of the tubes in the labyrinth is mesoblastic, formed by cords of cells appearing in the mesoblastic somites. But so excellent a pathologist as D. J. Hamilton declares without limitation that the renal epithelium is epiblastic, and classifies epithelial tumours of the kidney accordingly. Valuable light will probably be thrown on this question by examining a large number of primary renal neoplasms, in order to determine whether the activities of the connective tissue and of the epithelium are separable, or whether they are so closely inter-related, that all tumours of the kidney may be regarded as varying members of one great series. From this standpoint, we have examined twenty-nine examples of primary new growth in the kidney, which, with one exception, may be seen in the Pathological Museum of the University of Melbourne ; and we propose to indicate the general characters, and to briefly describe the histological structure of each of these specimens.

CATALOGUE OF CASES.

1. Lipoma (inactive).
2. Sarcomatous lipoma of hilum (active).
3. Multiple lipo-sarcoma (inactive).
4. Angioma (inactive).
5. Pure adenoma, with hyaline change (inactive).
6. Multiple papilliferous adenoma (inactive).
7. Papilliferous adenoma (inactive).
8. Multiple tubular adenoma (feebly active).
9. Tubular adenoma, with alveolar colloid development (inactive).
10. Cystic adenoma, at parts simulating carcinoma (feebly active).
11. Tubular adenoma growing freely, becoming cystic and hæmorrhagic (active).
12. Multiple fibrillating spindle-celled sarcoma, with epithelial growth (feebly active).
13. Adeno-sarcoma (feebly active).
14. Adeno-sarcoma (active).
15. Hæmorrhagic adeno-sarcoma (active).
16. Adeno-sarcoma taking carcinomatous form (active).
17. Round-celled sarcoma (active).
18. Cystic round-celled sarcoma (active).
19. Lympho-sarcoma (active).
20. Lympho-sarcoma (active).
21. Mixed-celled sarcoma, with tubular changes (active).
22. Large spindle-celled sarcoma (active).
23. Sarcoma carcinomatodes (active).
24. Sarcoma carcinomatodes (active).
25. Sarcoma carcinomatodes (active) in a case of old nephritis and perinephritis.
26. Sarcoma carcinomatodes (active).
27. Malignant adenoma [endothelioma] (active).
28. Myo-sarcoma (active).
29. Leucæmic kidney.

DESCRIPTION OF CASES.

1. Lipoma (inactive), female, aged 57. This is a rounded lipoma of the cortex, about 1 cm. in diameter, lying immediately beneath the capsule and slightly prominent on the surface. The edge is well defined, but there is no visible capsule. The cut surface shows fatty tissue, with small opaque grey

patches, and some dilated thin-walled vessels. Microscopically the general substance consists of fat cells supported by delicate connective tissue, but not arranged in definite lobules. The sections are traversed by bands of fibres and elongate cells supporting thin-walled vessels. The more opaque patches show abundant matrix, partly fibrillar, partly homogeneous, and in the meshes are found collections of nucleated cells, chiefly rounded and with intercellular substance between them, a few however being epithelioid and closely set. At the margin of the growth the microscope shows a slight imperfect capsule; but in some parts the fat cells abut directly on renal tubes. Around the edge there are large arterioles with thick walls, and likewise some fibroid glomeruli.

2. Sarcomatous lipoma of hilum (active). In a case of old hydronephrosis with fibroid change in the kidney, the organ is almost completely surrounded by a reniform mass of fat, 14 cm. long, 10 cm. broad, and over 6 cm. thick. The fatty mass is at most parts easily separable from the sub-peritoneal fat, retaining a definite outline and tumour form. The fat occupies also the whole hilum, blending thoroughly with the wall of the pelvis and with the renal tissue. The fat is firm, intersected by bands of fibroid tissue, and it contains considerable areas of boldly nucleated round cells. Embryonic tissue is also abundant where the fatty growth adjoins the proper substance of the kidney. Here it is largely composed of coarse spindles with fibrillar tissue.

3. Multiple lipo-sarcoma (inactive), male, aged 56. The kidney contains five small growths, all well defined but not encapsuled; all but one abutting on the renal capsule. The largest is 2 cm. in greatest diameter. Their cut surface is soft, partly granular, partly fatty. The left kidney contained one small growth of similar character. A microscopic section of a medium-sized growth shows it to be mainly composed of spindle cell sarcoma, mostly old and fibrified, partly rich in cells. Islets of fatty tissue are present here and there. At the margin there is at parts a copious growth of round cells. Here also there is evidence of activity in the neighbouring cortical tubes, and epithelial cells, or cells indistinguishable from them, may be found throughout the section. Arterioles with thick walls are very conspicuous around the edge of the growth. The suprarenal capsules both contained a growth of round cell sarcoma in the cortical substance, and there was a sloughing growth hanging from the soft palate. The columns of cells in the cortical substance of the suprarenal body do not closely resemble those found in any of the present series of tumours.

4. Angioma (inactive), female, aged 71. A rounded tumour, 2·4 cm. in diameter, extends from the capsule of the kidney, where it is slightly prominent, into the fat of the hilum. On section, it was originally spongy and full of blood; its edges are well defined, but not encapsuled. It consists of a larger superficial part and a small, deep part, between which runs a narrow fibrous-looking band continuous with the renal substance. A section has been made across this band showing both parts of the growth. Microscopically, the renal tissues show old chronic nephritis. Approaching the tumour the interstitial tissue becomes abundant, fibrillar and cellular, and the epithelial cells of the tubes, especially the straight tubes, become large, and their nuclei stain very deeply, so that many of these fields clearly resemble a tubular adenoma. In the fibrous band between the divisions of the tumour the tubules disappear, the capillaries begin to dilate, and the interstitial

tissue is abundant, fibrillar, and thickly dotted with cells. These are mostly of rounded form, but many are spindles in the tougher parts. Approaching the main growths the capillaries dilate more and more, and open into one another, till ultimately there are large cystic cavities filled with blood, and networks of smaller intercommunicating vascular spaces. Blood pigment has been abundantly deposited in part of the interstitial tissue. The spaces are usually lined by the flattened endothelium of the vessels, but in some cases the lining cells are large and swollen, and here and there show globules, apparently of colloid.

5. Pure adenoma, with hyaline change (inactive). This is a regularly oval tumour nearly 2 cm. long and 1·3 cm. broad, embedded in the cortex of the kidney immediately beneath the capsule. It is soft, pale yellow, distinctly encapsuled and divided by slight septa into lobules. Microscopically it is coarsely alveolar, the walls of the alveoli being firm and fibrous. The alveoli are lined with very large epithelial cells, which have largely undergone a vitreous hyaline change. The cells are sometimes in a single layer, sometimes in several layers. They may even fill the alveoli, and fuse into a wrinkled mass. At the margin there is at parts a simple thick fibrous capsule; elsewhere the capsule consists of a close alveolar structure, sometimes even resembling lympho-sarcoma, but the cells in the meshes are largely of epithelial type. Around the tumour the arterioles are numerous, and have very thick walls.

6. Multiple papilliferous adenoma (inactive), male, aged 55. A rounded growth 2·5 cm. in diameter is embedded in the cortex immediately beneath the capsule. A smaller tumour is buried in the cortex closely adjacent. The cut surface is pale, pitted, and finely filamentous. The edge is well defined, but there is no capsule. Microscopically the main structure is a mass of thin-walled cysts, more or less completely filled with delicate papillary ingrowths. Cysts and papillæ are lined with epithelium in one or several layers, sometimes approaching a columnar type, sometimes irregular, sometimes large, flattened, and endothelioid. The core of the papillæ consists of delicate spindle cell tissue. At the margin of the growth there is rapid transition into kidney tissue. The adjacent kidney tubes are partly blocked up, partly dilated, the nuclei of their epithelium staining feebly. In some parts these tubes are in immediate relation with fully-formed papilliferous cysts, but in other parts intermediate structures are found—namely, tubes either dilated or not, but lined by active cells with deeply-staining nuclei; tubes more or less dilated and filled with cells having deeply-staining nuclei; and then cysts with papillary processes.

The other kidney contained similar tumours. The patient had lymphomatous growths in the groins, axillæ, and spleen. The liver contained several cavernous angiomata.

7. Papilliferous adenoma (inactive). Immediately beneath the capsule of a large red granular kidney there is a firm spherical growth, 2·2 cm. in diameter, slightly prominent on the surface of the organ. On section, the growth is greyish white, homogeneous, sharply defined, but not distinctly encapsuled. Microscopically it is a typical papilliferous adenoma of the tubular type. The tubules are cut in different directions—some transversely, others longitudinally, and they are closely set in a fibrillar stroma

dotted with spindle-shaped nuclei. The tubules are lined with an irregular low epithelium, and are variously dilated into cysts. Delicate processes covered with similar epithelium have sprouted into most of the cysts, perhaps even filling them. Some of the processes are sessile, but others have only delicate stalks of attachment. and when these pedunculated processes grow freely in the cyst cavity they bear a striking resemblance to true renal glomeruli. In the larger cysts, however, the papillary growths become very complex by branching and mutual compression. The cores of the softer papillæ are composed mainly of delicate spindle cells, but those of the tougher ones show well marked fibrillæ. Here and there concentric colloid bodies are seen, some of them still having traces at their margin of epithelium belonging to aborted tubes. Arterioles and capillaries traverse the growth, but are not very abundant. At the margin the deeply staining tumour passes abruptly into the more feebly staining renal tissue. Along the line of junction there are numerous arterioles with thickened walls, some even being converted into solid fibroid tissue.

8. Multiple tubular adenoma (feebly active), male, aged 50. The kidneys are in an advanced stage of chronic nephritis, somewhat enlarged, with adherent capsules, granular surface, and many small cysts. One of them contains two small tumours; (*a*) abutting on the capsule, of flattened rounded form, 1 cm. across and ·5 cm. in thickness; this had a homogeneous fleshy section, and projected slightly from the surface; (*b*) buried in the cortex a short distance from the capsule, spherical, ·8 cm. in diameter, with a finely pitted cut surface. The former possesses a distinct fibrous capsule blending superficially with that of the kidney. Sections consist of an irregular tubular gland tissue, the elongate tubes being bounded by thin walls of fibrous tissue, lined by one or several layers of epithelial cells with large oval nuclei. But over a great part of the section the tubules are filled with such cells, and the fibres bounding them are reduced to a minimum, producing an indistinctly alveolar tissue, somewhat resembling carcinoma. The alveolar walls contain many spindle cells. Some parts are more coarsely alveolar than others, and in these the large alveoli are firm walled, and lined by a single layer of cubical epithelium; but from the main wall a delicate network spreads through the alveolus breaking it up into smaller irregular spaces, lined by a softer, less definite, more rapidly proliferating epithelium. In certain places the growth has penetrated the main capsule of the tumour, and formed well-defined alveoli in contact with the renal tissue. The coats of the renal arterioles in the immediate neighbourhood of the tumour are immensely thickened. There are no distinct proliferous cysts, nor pseudo-glomeruli.

9. Tubular adenoma, with alveolar colloid development (inactive), male, aged 60. This large sub-granular kidney contains a strongly encapsuled spherical tumour 2 cm. in greatest diameter, abutting on the capsule of the organ, and boldly prominent on the surface. A smaller rounded tumour, ·8 cm. in diameter, also encapsuled, is buried in the cortex, but only partly separated from the main growth. Their cut surface is pale yellow, fleshy, with rusty streaks of old hæmorrhage and with conspicuous dilated vessels. Microscopically, at some parts, there are remains of a tubular adenoma lined by columnar nucleated cells; but for the most part the growth has become irregularly alveolar, the alveoli having thin walls of fibrillar and spindle cell tissue, and being more or less completely filled with irregular cells having large nuclei. These cells are largely undergoing colloid change, clear

globules appearing, distending the cell and displacing the nuclei. Where the alteration is most advanced the resulting tissue resembles myxoma, but has been produced by progressive alteration of the alveolar epithelium. The capillary blood vessels are abundant, thin walled, often dilated or even ruptured. There are no proliferating cysts nor pseudo-glomeruli.

10. Cystic adenoma, at parts simulating carcinoma (feebly active), male, aged 67. This specimen came from an old man with enlarged prostate. The left kidney is in an extreme condition of hydro-nephrosis, with fibroid change and atrophy of the renal tissues. But it also contains a rounded tumour, 4 cm. in greatest diameter, bulging both beneath the capsule and into the dilated pelvis. On section, the tumour is sharply bounded and encapsuled, its cut surface being moderately soft, grey, finely pitted, with more homogeneous patches which are undergoing caseation.

A section has been taken from a part where a process of the capsule runs into the growth, branching out and carrying large blood-vessels with it. Here the dilated capillary vessels are very conspicuous, and also larger spaces filled with extravasated blood corpuscles, among which numerous blackened carrier cells may be seen.

In this case the fundamental tissue is tubular adenoma, with a lining of columnar cells. But it has been modified in two directions. The chief change is the development of cystic spaces, bounded by fibrillar tissue, processes of which extend into the spaces. The spaces and the processes are lined by epithelial cells, which tend to become swollen by colloid change. The processes sometimes fill the spaces and fuse into a pseudo-alveolar tissue. The other and less extensive modification presents a minimum of cyst development, and produces an indistinctly alveolar tissue, in which the cells are largely colloid, and which at first sight closely resembles carcinoma. It will be noted, however, that the tumour is almost certainly of slow growth.

In the fibrous framework of this specimen many large pseudo-glomeruli are embedded.

11. Tubular adenoma, growing freely, becoming cystic and hæmorrhagic, male, aged 39. The inferior end of this kidney is replaced by a lowly lobulated growth, 10·7 cm. long and 6 cm. in thickness, which projects slightly under the capsule and bulges into the hilum, projecting by a conical process into the pelvis. On section, it is elastic and lobulated, the septa being greyish white and firm, while the lobules are rounded, 1 or 2 cm. in diameter, softer, pale yellow, and pitted or granular. Microscopic sections have been taken from the edge. The lobules are bounded by firm fibrous tissue, and consist of tubules variously dilated into cyst-like spaces. The tubules have a thin basement membrane, and are lined by more or less regular broadly columnar epithelium, with large nuclei lying near the attached end of the cells. The cystic spaces also are at first lined with epithelium, less regular in form and arrangement; but the larger spaces are separated only by thin walls, lined on both sides by one or more layers of large epithelial cells showing advanced hyaline change. In the most advanced parts the septa are largely broken down. Many of the spaces are full of blood.

At the margins of some of the lobules the tubules are not dilated, but are straight or curved in correspondence with the lobular edge; their epithelium is disposed in one symmetrical layer nearly filling the tubule. The adjacent renal tissue shows advanced fibroid changes, the tubules being much compressed, though their epithelium often continues active, so that lines of deeply-stained epithelial cells are often seen embedded in fibrous tissue. At the edge of the tumour the fibrous tissue forms a kind of capsule, becoming very dense; but here also relics of tubes persist, active epithelial cells in small lines and groups being dotted here and there, and again becoming more prominent near the adenoma growth. Some parts of this tissue closely imitate carcinoma. At other parts of the margin the cells are very numerous and disposed in more sarcomatous fashion without definite grouping and with intercellular substance between them.

12. Multiple fibrillating spindle cell sarcoma, with epithelial growth (feebly active), male, aged 68. This kidney contains two small independent tumours rising boldly beneath the capsule. The larger consists of a superficial and a deep part. The former is 2·3 cm. long and 1 cm. thick, and lies almost completely outside the line of renal tissue, but it is continuous with the deep part, which is wholly embedded in the kidney substance, and measures 1·5 cm. in length by 1 cm. in thickness. The smaller tumour resembles the superficial parts of the larger growth. On section, the substance of both is firm, grey, fasciculated, well defined, but not distinctly encapsuled.

Microscopically they consist of fibrifying spindle cell sarcoma, but epithelial growths are scattered here and there, sometimes in great abundance. These growths are partly in the form of imperfect tubes or cylindrical columns of cells, but partly form irregular infiltrations resembling carcinoma in arrangement, though without signs of active spread. A few small cyst-like dilatations are also present, lined with proliferating epithelium, processes of which may fill the cyst.

In general appearance these growths are perfectly innocent.

13. Adeno-sarcoma (feebly active), male, aged 20. A rounded tumour 2·2 cm. in diameter is deeply embedded in the substance of the kidney abutting on the sinus. On section, it is soft, grey, not encapsuled, with a pitted surface. Microscopically it shows areas of round cell sarcoma intersected by fibrillating bands of spindles. The vessels are delicate, and bounded only by spindle cells. But there are also great numbers of epithelial tubes, some sharply bounded by basement membrane, others less defined forming solid columns of epithelium, and these pass into vague epithelial infiltrations, where epithelial cells are massed together confusedly, or lie in the meshes of a fibrillar tissue blending with the sarcoma tissue. Attempts at cyst formation are present at intervals. Some of the epithelial infiltrations simulate carcinoma, but microscopically the tumour has no appearance of malignity.

14. Adeno-sarcoma (active), male, aged 51. The right kidney is large, pale, firm, with adherent capsule and numerous small cysts. On its anterior surface projects a rounded lowly nodular growth about 6 cm. in diameter and 5·5 cm. in thickness. It extends through the substance of the kidney so as to present into the pelvis. The presenting part has a comparatively narrow attachment to the main growth, but has grown within the pelvis into a flattened ovoid polypus nearly 4 cm. long and 2·5 cm. in greatest width. The cut surface of the main growth is pale, grey, largely mottled with rust-coloured patches. It is firm to the touch, but coarsely porous. Microscopically two kinds of tissue are present, adenoma and sarcoma. The adenoma

tissue is arranged in bold alveoli, bounded by dense fibrous tissue with spindle cells, and lined by huge nucleated epithelial cells in one or many layers. The alveoli are more or less completely filled with proliferous papillary growths also covered with similar epithelium, and containing only a slight core of fibrils or spindle cells. Masses of epithelium often grow on these papillæ.

The epithelium does not appear to be absolutely discontinuous with the walls of the alveoli; for the inner layers of these walls become more and more infiltrated with cells, at first small and staining deeply with carmine but gradually passing into the large epithelial plates of the alveoli, of which only the nuclei are stained.

The sarcoma tissue is composed of rounded and spindle cells, at parts strongly fibrified, and with numbers of well-developed glomeruli, as well as others that have become fibroid or almost homogeneous. Amidst the sarcoma tissue are patches of epithelial cells; and by fibrillation of the sarcoma tissue and development of the patches of epithelial cells the sarcoma part merges into the adenomatous part. Blood vessels are abundant, and granules of altered blood pigment are scattered here and there.

15. Hæmorrhagic adeno-sarcoma (active), female, aged 22. In the upper part of the left kidney there is an oval partly encapsuled tumour 9 cm. long and over 6 cm. broad. On section, it is distinctly lobulated, some of the lobules being soft and fleshy and others hæmorrhagic. The hæmorrhagic portions are in several instances enclosed in dense subordinate capsules. The softer parts show an obscurely pitted or papillary character. Beyond the main capsule soft growths of a similar character are found in the kidney substance. Extensive infiltration has occurred in the glands of the hilum and the retroperitoneal glands. A massive growth is present on the left side of the neck adherent to the great veins, with consequent thrombosis. Copious growth in the mediastinum, especially around the left pulmonary vessels, led to collapse of the left lung. The liver is full of soft nodules, more or less confluent.

Microscopically the renal tumour is very largely composed of papillary adenoma, with extensive hæmorrhage into the cyst cavities. There are also areas of sarcoma and myxosarcoma, with rounded and elongate cells lying in a reticulum of varying closeness. A section of one of the smaller growths in the kidney shows the renal tubes in close relation to the tumour elements. Some of the tubes pass into the sarcomatous tissue, losing their basement membrane, the cells remaining active and becoming indistinguishable from the sarcoma cells. *(Figs. 1, 2, and 3.)*

16. Adeno-sarcoma taking carcinomatous form (active). In this case the kidney from a man, aged 46, is replaced by a rounded, lowly lobulated tumour, weighing 46½ ounces (1·5 kilos.), measuring 13·5 cm. in length, 12·7 cm. in breadth, and 8·5 cm. in thickness, filling the hilum, and sprouting boldly into the pelvis. Cylindrical processes ·5 cm. thick were passed in the urine.

On section, the superficial part of the growth is fairly firm, yellowish, indistinctly lobulated, and semi-caseous. The deep part towards the hilum is soft, lobulated, with an appearance that, even to the naked eye, suggests minute papillary cysts. Microscopically, the growth presents very varied types of tissue, among which the following may be mentioned :—

(*a*) Large spindle cells, either closely set or lying in a delicate fibrillar substance.

(*b*) Adenomatous epithelial formations, either regular and circumscribed, or diffuse and resembling carcinoma.

(*c*) Transitions between the foregoing. Thus the adenoma in part consists of irregularly swollen tubes, lined or filled by large boldly nucleated epithelial cells, and having a distinct basement membrane. Such regular formations may pass into diffuse epithelial infiltrations, with clumps of epithelial cells lying in the meshes of a fibrillar tissue, and thus assuming carcinomatous forms. These again pass into more vague infiltrations, with similar cells arranged singly, with fibrillar or other intercellular substance between them. And these vague infiltrations merge into sarcoma tissue, the broad epithelial cells becoming elongate and passing into spindles, which may be disposed in open fashion, or in close aggregations. Here and there cystic spaces occur, bounded by fibrillar tissue, and lined by large epithelial cells, columnar, pear-shaped, or broadly flattened. Not a few of these spaces contain papillary growths, covered with epithelium. Some of these epithelial cells possess distinct outrunners continuous with the fibrillar tissue. Even in the more confused parts of the section, it is common to see a fibrillar core surrounded by epithelial cells. *(Fig. 4.)*

The processes that came away in the urine showed a similar structure; partly a tissue consisting largely of epithelium, sometimes with a more or less definite alveolar arrangement, and partly of papillary growths in which a fibrillar or myxomatous core containing one or more capillaries is covered with epithelial cells. Some of these capillaries are in the closest relation with the epithelial cells, which are arranged around them radially, as in cylindroma.

17. Round Cell Sarcoma (active). This kidney is from a child. The tumour is of broad oval form, flattened from before backwards, measuring 18·3 cm. long, 17 cm. broad, and 11·4 cm. thick. It is of soft elastic consistence with large areas of hæmorrhage. Microscopically it consists of round cell sarcoma tissue, intersected by bands of spindle cells. The sarcoma cells have very large round nuclei, but the cell substance is relatively scanty, and the outlines of the cells feebly defined. In the areas of hæmorrhage hyaline changes have occurred, forming heaps of large colloid-looking globules, or crenated masses of similar substance.

18. Cystic Round Cell Sarcoma (active), male, aged 3. The right kidney contains a rounded nodular mass of soft sarcoma 13 cm. in greatest diameter, varying in consistence, with a few cysts of considerable size in its substance. Its margin is for the most part ill defined, and the growth has filled the hilum. The sarcoma is of round cell type with bands of spindles, and with areas of loose fibrillar tissue containing spindle cells. At the margin some epithelial cysts may be found, the epithelium multiplying, and its progeny apparently blending with the other elements of the tumour. The left kidney was slightly affected with similar growth, and the lungs and liver were studded with soft growths.

19. Lympho-sarcoma (active), male, aged 69. The upper end of the kidney is occupied by a tumour partly smooth, partly lowly nodular, which extends much further down the inner than the outer side of the kidney. It is included within the same capsule as the kidney, but is partly deliminated by an irregular furrow, having here somewhat the appearance of an accretion to the kidney, and not a true renal growth. It is 5·8 cm. long on the inner side of the kidney, 5·5 cm. on the outer side, and over 3·5 cm. in thickness from before backwards. On section, it is incompletely lobulated, yellowish, partly firm, partly soft, with a wavy outline where it becomes abruptly continuous with the renal tissue. The cut surface is intersected by curved bands of fibrous tissue, and is dotted with dilated vessels.

Microscopic sections vary greatly in different parts, and chiefly according to the development of the stroma. In the firmest parts it is almost homogeneous, closely felted, sometimes even approaching in character to fibro-cartilage. The loculi here contain cells chiefly branching, the outrunners of which join with the stroma. In the softer parts the stroma is less abundant, and its bundles become fibrillar and then pass into spindle cells, the outrunners of which help to form a delicate reticulum. Embedded in this reticulum are cells, the nuclei of which stain more deeply, varying in form, usually small, but sometimes large or even epithelioid, and perhaps showing colloid change. In the most typical parts, round and spindle and branched cells are variously mixed together. Capillaries are numerous and often greatly dilated, and extravasations are occasionally met with. Islets of involuntary muscle-fibre are present, but few in number, and these chiefly connected with the vessels.

20. Lympho-sarcoma (active), female, aged 5. There is a nodular growth 18 cm. long and over 14 cm. in greatest thickness. The cut surface is divided into rounded lobules of varying size by reticular bands of tough white tissue. The lobules are soft and yellowish, with a tendency to softening and cyst formation. One lobule is entirely hæmorrhagic. At one part of the surface a small area of kidney tissue is visible. The tumour lobules adjacent to this area have well-defined rounded margins and thin firm capsules.

A microscopic section shows the main structure of the lobules to be lympho-sarcomatous. At parts there is typical lymphoma tissue with a fine open reticulum, and with round cells lying isolated in the meshes. But, as a rule, though the reticulum is distinct the cells are more abundant and less regular in shape. Here and there the lymphoma tissue passes into myxolipoma. The bands between the lobules consist of fibrous tissue and spindle cells, the bands varying greatly in thickness. Patches of brownish yellow pigment are numerous. The arterioles have extremely thick walls, and the intima is sometimes greatly developed, even forming quasi-columnar cells. In certain areas remains of tubes may be seen with altered epithelium, partly degenerating, partly multiplying, and epithelioid cells are very distinct in many parts of the reticular tissue.

21. Mixed Cell Sarcoma, with tubular changes (active), male, aged 26. This specimen is from a large, soft, infecting tumour occurring in a young adult. The kidney was not preserved, but a microscopic section shows sarcoma tissue varying from the round cell to the fibrifying spindle cell type. Embedded in the sarcoma tissue are tubules and tufts partly undergoing atrophy, partly

showing active development. In some of these tubules the nuclei of the cells stain deeply; in others the basement membrane has disappeared, leaving a concentric solid clump of cells; in others the cells in a clump have taken spindle shape, or even become greatly enlarged and pyriform. In the tufts the developmental changes consist in the presence of large deeply-stained nuclei, and in marked proliferation of the cells lining the capsule, so as to assume broad endothelial forms.

22. Large spindle cell sarcoma (active), female, aged 42. A large, soft, rounded tumour 9·6 cm. in length has replaced most of the kidney substance, and in parts has burst through the capsule of the organ. On section, it has a fairly well-defined edge, but is not encapsuled. The pelvis is compressed but not invaded. Patches of softening are scattered through the growth. Secondary tumours were present in the lungs.

Microscopically it is a large spindle cell sarcoma. The older parts show remains of kidney tissue, and have undergone partial fibrillation. The Malpighian tufts have also become fibroid. The straight tubes are chiefly atrophied, but some retain their epithelium with deeply-stained nuclei. Similar epithelioid cells, enlarged and active, are found solitary or in clumps amidst the sarcoma tissue, producing in places a decidedly carcinomatous appearance.

The growths in the lungs are also spindle-celled, but not of so pure a type as that found in the kidney.

23. Sarcoma carcinomatodes (active). This specimen is from a man, aged 20, and consists of a large, soft, rounded growth, 13·3 cm. in length, occupying all the upper part of the left kidney. It is fairly well outlined, but not encapsuled. On section it is partly caseous, partly hæmorrhagic; the pelvis is compressed but not invaded. The lower part of the kidney shows numerous diffuse nodules of soft elastic growth, ill defined, and tending to become confluent. There were secondary growths in the retro-peritoneal glands. a few nodules in the lungs, and multitudes of small growths in the pleuræ. The liver was thickly studded with soft white growths individually of small size, but frequently running together into large masses only vaguely defined from the hepatic tissue around. This organ weighed 6·5 kilos.

Microscopically, two kinds of tissue are present, one derived from tubular epithelium, and the other from connective tissue. The two kinds are blended together in varying proportions, and each presents varying degrees of development. The simplest form in which the epithelial type predominates shows tubes cut in various directions, and lined by a variable but active epithelium, with boldly stained nuclei. These tubes have a basement membrane, and are supported by a fairly abundant fibrillar tissue containing spindle cells. In other parts these tubes tend to dilate into cystic spaces, often lined with elongate epithelial cells, which may be several layers deep, with a tendency to papillary growth. Such cysts, however, are few in number. A more extensive change is seen where solid clusters of epithelial cells, arranged in alveolar fashion, occur abundantly in a fibrillar matrix. In large areas these epithelial cells almost fill the field, escaping from the alveoli, but now behaving more like the elements of a sarcoma, not being packed together, but with a fine intercellular substance between them.

The other kind of tissue, derived from the connective stroma, plays on the whole a minor part. It chiefly forms the matrix between the glandular tubes or cysts or diffuse epithelial growths, being mainly fibrillar with spindle cells, but sometimes though rarely crowded with round cells. Here and there it forms the chief element in large areas. The principal part of this tumour, therefore, consists of large epithelioid cells derived from the tubular epithelium, growing diffusely in a delicate connective tissue matrix, and being arranged like sarcoma cells, with vascular spaces between them, so as to come into close relationship with the circulating blood.

The lungs are thickly sown with minute growths, in which the cells are in immediate relation with the vessels; but the cells are largely epithelioid in type, with large oval nuclei and distinct nucleoli; and here and there may be seen attempts at papillary cyst formation. Between the groups of epithelioid cells there is scanty fibrillar tissue with spindle cells; so that both the elements of the renal tumour appear to have been reproduced in the lungs. The secondary growths in the liver present essentially the same characteristics. *(Fig. 6.)*

24. Sarcoma carcinomatodes (active), male, aged 62. The kidney is largely converted into a lowly lobulated tumour, and now measures 15·3 cm. in length, 10·3 cm. in breadth, and 7·8 in thickness. At the upper part some renal tissue still remains; below this there lies the main mass of the tumour bulging superficially under the capsule, and deeply infiltrating the pelvis, fungating into its interior, and plugging the renal veins. Still lower the kidney tissue reappears, but is infiltrated with soft nodular out-growths from the main mass. The main tumour shows in part of its surface a large area of opaque white fibroid substance containing small cysts and with outrunners passing into the softer part of the tumour. Otherwise it is yellowish and semi-caseous, but intersected by lines of whitish fibroid tissue. The softer recent nodules also display a fine framework supporting a softer yellow tissue.

Microscopically the firm white fibroid substance consists of firmly fibrillated sarcoma, with a minimum of cells, but with numerous large, firm-walled capillaries. Near the soft parts the spindle cells become numerous, and still nearer these give place to rounded and epithelioid cells. The typical tissue in the softer parts consists of very large irregular epithelioid cells, either disposed in masses in sarcomatous fashion with embryonic vessels passing among them, or lying in a more or less alveolar fibrillated tissue. Even in the most alveolar parts the epithelioid cells are frequently furnished with outrunners, and are in intimate relations with the fibrillar tissue. The transition from cells of connective tissue type to alveolar type is sometimes clearly evident. Here and there, however, columns of epithelial cells are indistinctly visible, as if indicating an origin from primitive tubes. Much of the epithelium is degenerate, the cells containing numerous hyaline and fatty globules. This tumour, therefore, consists of a sarcomatous tissue, the cellular elements of which are largely epithelioid, with a tendency at parts to imperfect alveolar arrangement.

25. Sarcoma carcinomatodes (active). This is an old specimen, of which no history has been preserved. It was labelled "Malignant and Suppurative Perinephritis." Sections now stain badly.

The kidney is converted into a gristly, partly cystic, substance, without great alteration in size, but it is embedded in a mass of softer growth which binds it to the aorta and surrounding structures. The gristly substance is chiefly fibroid, with relics of renal tubes; but at parts there is a mixed celled sarcoma, the cells lying separately in a fibrillar tissue. At parts the cells are distinctly epithelioid, either lying separately in similar fibrillar tissue, or forming small clumps in a more alveolar fibroid matrix. Even in this case the cells are closely related to the matrix, and transitional forms are seen between the more sarcomatous and the more carcinomatous parts.

Sections of the softer growth are more distinctly alveolar, but most of the contents of the alveoli have fallen out in the process of mounting.

The alveolar walls are mainly composed of delicate fibrillar tissue with numerous spindle cells, but at parts are more coarsely fibrous. The contents consist of large flattened cells, varying in shape, with slightly granular cell substance and bold nuclei. They are closely connected with the alveolar walls, into which their outrunners distinctly extend. The process may be traced in cells which rise up from the walls, either flattened or spindle or irregularly columnar or pyriform in shape; at first they are indistinguishable from the cells in the alveolar walls, but ultimately they appear to become detached through the growth of other cells beneath them. Some tracts of cells are not alveolar but diffuse, with delicate fibrillar tissue running between the individual cells; but the most definite tubes may be found opening out into continuity with such diffuse cellular formations. In some of the alveolar masses of epithelium extensive hyaline degeneration has occurred, and a few peculiar nests are also found where tubes or vessels have been blocked and converted into masses of concentric scales, at the margin of which new endothelial plates are actively growing and applying themselves in similar lamellar order.

26. Sarcoma carcinomatodes (active), female, aged 3. The left kidney is greatly enlarged: 14·3 cm. long, and 8 cm. thick. A section of it is mainly occupied by a soft yellowish growth, mostly granular, or finely pitted or dotted with minute cysts. The mass of the growth is traversed by branching fibrous septa, but the superficial parts are arranged in rounded lobules more or less distinctly enclosed by narrow fibroid bands. In the superficial parts areas of altered kidney substance are still visible, mostly composed of pyramidal tissue, and in connection with these areas some larger cysts have been developed. Some of the nodules of the tumour are soft almost to diffluence. The surface of the kidney is at parts nodular also, some of the more sharply defined nodules being sprouting processes of the growth. The hilum is filled with soft new formation, and this is continuous with a massive infiltration behind the peritoneum. The retroperitoneal growth is softer than that in the kidney, but similarly lobulated, and tending even more strongly to minute cyst formation. A nodule of similar substance is present in the hilum of the right kidney.

Microscopically, the tumour in the kidney presents an alveolar formation. The walls of the alveoli vary much in thickness, and consist of fibrillar tissue with numerous cells, chiefly spindle, but partly rounded. This tissue is evidently highly vascular, and lines of blood corpuscles may still be found in it. Within the alveoli there are masses of cells with bold nuclei.

To this extent the tumour resembles carcinoma; but the cellular masses are not as a rule sharply defined from the alveolar walls. Fine fibrils penetrate the masses of cells, and embryonic vessels with blood corpuscles are also found among them. At the margins of many of the alveoli there is a distinct transition between the alveolar walls and the alveolar contents, the cells in the wall becoming plumper and more numerous, though still having distinct intercellular substance between them, and finally merging into the cellular masses within the spaces. In many areas also the alveolar formation is not well marked, and the cells, though plump and multitudinous, are not closely applied one to another, and in such parts embryonic vessels are in immediate relation with the cells.

The kidney substance has been converted into a fibrillar substance, with spindle cells and dilated capillaries full of blood corpuscles. and with relics of tubes and tufts, of which the epithelia are decidedly active. Near the tumour tissue, tubes may be found lined by active epithelial cells with deeply staining nuclei, afterwards losing their basement membrane, and swelling into club-shaped masses of epithelium; and at all parts of the section a series of such swollen lines of epithelium merge into the alveolar formation.

The retro-peritoneal growth is not alveolar, but is lympho-sarcomatous, with a finely fibrillar mesh, in which cells of varied type are crowded together with embryonic vessels running among them. This densely cellular substance is intersected by more open tissue consisting of spindle or branched cells, with a fine fibrillar matrix; but, as in the renal growth, the two types of tissue are distinctly continuous one with the other, and are in no way comparable with the separate epithelial and connective tissue elements of true carcinoma.

27. Malignant adenoma (endothelioma), with sarcoma of stomach (active). This kidney, from a man aged 58, contains an oval growth 10 cm. long, 7·3 cm. broad, and nearly 6 cm. thick. At the upper and lower ends of the growth the renal tissue is still distinct. On section the tumour is well defined, and partly encapsuled; its cut surface is lobulated, soft, finely pitted, with patches of old hæmorrhage and caseous softening. A few distinct cysts are present in its substance and at its margin. A section has been cut, including a mass of hardened fibrin and patches of the soft tumour substance around. In some of the soft areas there is only a delicate fibrillar mesh, containing a variable number of endothelial cells, some of them small, others swollen into huge rounded or irregular plaques. Such a simple tissue is traversed here and there by rudimentary tubules, some destitute of cells, others having an imperfect endothelial lining. But other widespread areas are much more characteristic; these show a marvellous imitation of renal tubes, lined or filled by cells, and supported by delicate fibrillar tissue. With tubules and cystic spaces, bounded by a basement membrane, lined or filled with active epithelioid cells, there is a close resemblance to malignant adenoma or carcinoma. But closer examination shows that the whole tissue is mesoblastic. The cells within the basement membrane are epithelioid, not epithelial. The basement membrane is fibrillar, and connected with the fibrils of the supporting tissue, or even with outrunners of epithelioid cells in this tissue. When most of the cells have fallen out of the tube or cyst-like space, the remaining elements may be seen rising in epithelioid fashion on the inner surface, with outrunners prolonged along the basement membrane, and others become produced in pyriform shapes retaining a narrow connection with the membrane.

Scattered among the tubes are areas of diffuse endothelial growth. In some parts there are simply masses of nucleated endothelial plates, arranged somewhat in sarcoma fashion, with vascular spaces between them; in other parts the cells have become branched and united into a kind of open myxomatous tissue with embryonic vessels. Tubes open into both of these kinds of tissue, and cells lining the tubes become continuous with the cells of the tissue. *(Fig. 5.)*

The sarcoma of the stomach was apparently an independent growth of mixed-celled type, round and spindle cells and fine fibrils being blended together without any tubular or alveolar arrangement, and with embryonic vessels in immediate relationship with the cells.

28. Myosarcoma (active), male, aged 2.—A soft rounded growth, 12·6 cm. in diameter, completely replaces the right kidney, a still softer growth projecting in the position of the hilum. Microscopically it consists of spindle cells, with elongate nuclei, mostly lying isolated in a delicate fibrillar tissue, but at parts more closely clustered together. In these clustered parts a large number of the spindles show strongly-marked cross striation. Sometimes the striated spindles are compound, as if several had joined end to end, though the compound forms seem to have originated from elongation of single spindles, with division of the nucleus. Some of the striated spindles have widened out so as to have parallel borders. Another peculiarity of this tumour consists in the presence of foci of intense growth, of small round cells, composed almost entirely of a deeply stained nucleus. Here and there, but only sparsely, a tube may be found lined with active multiplying epithelium, with deeply stained nuclei.

29. Leucæmic kidney, female, aged 24.—In this case of leucæmia the spleen and lymphatic glands were greatly enlarged, but none of the organs showed any gross development of lymphoid tumours. In the kidney the microscope reveals a marked patchy development of lymphoid tissue, especially in the superficial parts of the cortex, with rounded and elongate cells lying in a fine fibrillar meshwork.

CONCLUSIONS.

From this series of cases we draw the following conclusions:—

(1) In an apparently simple lipoma of the kidney there are tracts of embryonic cellular tissue, mostly resembling round-celled sarcoma, but partly epithelioid. Some lipomata are progressive and infiltrating, and these contain a considerable admixture of sarcoma tissue, either round or spindle-celled. Islets of well-formed fatty tissue may be present in tumours which histologically resemble sarcoma, but the presence of such islets indicates comparative innocence.

(2) True angioma of the kidney may show all grades of capillary dilatation until networks of inter-communicating vascular spaces are formed. In the neighbourhood of a simple angioma, the epithelial cells of the renal tubes may be active, with deeply staining nuclei. Angioma must be distinguished from hæmorrhagic cystic adenoma, and from simple hæmorrhage.

(3) No definite line can be drawn between the various types of adenomata of the kidney. All our cases seem to originate in renal tubes, and not in adrenal or Wolffian inclusions. In not a single instance is there the least resemblance to adrenal tissue. The simplest adenoma consists of tubes or alveoli lined or filled with large epithelial cells, which may become hyaline, colloid, or fatty. The softer forms are often composed of cysts with papillary ingrowths, the core of the ingrowths being sometimes fibrillar, sometimes embryonic and cellular, while the epithelial lining varies from a single layer of columnar cells to heaped-up layers of large flattened endothelioid plates. In some cases, many of the ingrowths are pedunculated, and grow freely in the cystic spaces, so as to produce pseudo-glomeruli. All stages may be traced of transformation from simple tubes into papilliferous cysts. Some adenomata are encapsuled, while others abut directly on renal tissue. The adjacent tubes are partly atrophied, fibroid, or otherwise degenerate, but partly show signs of epithelial activity, the nuclei staining deeply. In encapsuled adenomata, similarly active tubes, or cylinders of epithelium derived from tubes, may be found in the capsules. These capsular developments are worthy of close study, for sometimes the epithelial growth is so extensive and so irregular as to produce an alveolar structure resembling carcinoma or alveolar sarcoma, while the main tumour in its macroscopic characters continues perfectly innocent. In other cases, round and spindle cells may be so abundant in the capsule as to resemble sarcoma, but without any corresponding malignity.

(4) The pseudo-carcinomatous development, just described in the capsule of certain adenomata, may be the main histological type throughout a tumour. In this case the tubules or cysts are replaced by alveolar formations, the alveoli being bounded by finely fibrillar tissue with spindle cells and being more or less completely filled with large irregular epithelioid cells, sometimes extensively colloid. These pseudo-carcinomata may remain small, inactive, and distinctly encapsuled. Such alveolar formations may occur side by side with the most typical papillary cysts. Not one of our cases of renal adenoma has passed into typical carcinoma, with corresponding malignant history.

(5) Adenomata of either the tubular or the papillary cystic type may grow freely and become hæmorrhagic. In some of these cases there is an admixture of ordinary sarcoma tissue, but progressive growth is not necessarily dependent on such admixture.

(6) Some sarcomata of the kidney, especially of the fibrifying spindle-celled variety, may remain small and inactive. In such small indolent growths there may be large epithelial developments, with distinct tubes, or columns of epithelial cells, or masses of epithelioid cells arranged in sarcoma fashion, or even an

alveolar structure resembling carcinoma, but without any sign of active spread; or there may be cystic spaces, with or without papillary processes. Some of these indolent tumours are encapsuled, but others are not.

(7) In actively growing tumours there may be fairly pure sarcoma, or copious admixture of sarcoma with epithelioid growth. The purer types may be round-celled sarcoma, or lympho-sarcoma, or spindle-celled sarcoma, or some combination of these; and may be variously modified by hæmorrhage, caseation, cyst formation, &c., or, on the other hand, by fibrous, mucoid, or lipomatous development. Even in the purest types, evidences of epithelial activity are seldom wanting at the margin of the growth, and large endothelial cells are frequently found scattered in the sections.

In the complex types, the epithelial developments resemble those described in the complex inactive sarcomata and in the irregular adenomata, viz.:—

(*a*) Tubes variously dilated, and lined or filled with epithelium.

(*b*) Cysts lined by one or many layers of possibly huge epithelioid cells, and perhaps more or less completely filled by papillary growth.

(*c*) Solid epithelial cylinders, without basement membrane.

(*d*) Vague epithelial growths, the epithelial cells filling large areas, not being, as a rule, closely applied to one another, and being in intimate relations with embryonic blood-vessels.

(*e*) Similar epithelial growths, but with fibrillar matrix between the individual cells.

(*f*) Alveolar formations, in which, however, the epithelial cells are not always in contact, having in many cases distinct outrunners, and being evidently in close connection with the alveolar walls.

(*g*) Tubular or alveolar formations, in which the cells have a decidedly endothelial type, being developed in connection with the alveolar walls, and merging into diffuse epithelioid formations, which are not alevolar, and which have no likeness to carcinoma.

These varieties of epithelial development may constitute mere complications of sarcomatous growths; but in other cases they form the chief histological element of large malignant tumours. The typical adenoma and typical sarcoma both pass insensibly into these pseudo-carcinomatous structures.

(8) In actively growing sarcoma of the more infiltrating kind, renal tubes and tufts may remain amidst the embryonic tissue. In this case they may either atrophy, or may show developmental changes in their epithelium or endothelium.

(9) Particular attention should be given to areas of transition, in which pseudo-carcinoma merges into sarcoma, or in which distinct epithelial tubes pass into sarcoma. In the former case, discrete epithelial cells, lying clustered in alveoli, pass into cells with outrunners; some of the outrunners distinctly join the connective tissue matrix; other epithelial cells pass into long spindles, and becoming closely compacted together, blend insensibly with fibrillated spindle-celled sarcoma. On the other hand, when epithelial tubes pass into sarcoma, the basement membrane disappears, but the cells remain active, forming solid cylinders, which swell out and become less and less definite, the cells fusing with the round-celled sarcoma tissue.

(10) Probably most of the epithelial cells in the vague infiltrations and alveolar formations are derived from tubular epithelium; but in part they are derived from endothelium of lymph spaces. In the case that we have named "malignant adenoma (endothelioma)," the endothelial origin was perhaps predominant.

(11) Even in tumours which in their histological character most closely resemble carcinoma, infection takes place in sarcomatous fashion. The lungs are usually the chief seat of infection, and the secondary tumours in the lungs are decidedly sarcomatous, though perhaps displaying attempts at the formation of epithelioid structures, such as papillary cysts, &c. The retroperitoneal glands are frequently converted into massive growths, but these also are modified sarcomata. In all secondary growths malignant cells will be found in immediate relation with embryonic blood-vessels.

(12) No case of dermoid tumour is found in this series.

(13) The general conclusion therefore is that, so far as new growths are concerned, the renal epithelium behaves as a mesoblastic and not as an epiblastic formation, and that the tumours most closely resembling carcinoma in structure are not carcinomatous in nature or history. Hence we have used the name "sarcoma carcinomatodes" to designate them.

(14) When a malignant tumour of the kidney fungates into the pelvis, large cylindrical processes may come away in the urine, and be mistaken for villous growths from the bladder. This is especially apt to occur in cases of "sarcoma carcinomatodes."

(15) Absence of capsule does not necessarily betoken malignity, or even progressiveness. A histological structure closely resembling carcinoma, with alveolar arrangement, large epithelioid cells, and bold nuclei, is compatible with clinical innocence. The macroscopic and clinical characters of the growth are of especial importance in estimating the malignity of any renal tumour.

(16) This series of cases includes one of rhabdo-myo-sarcoma, and other cases of sarcoma were associated with the presence of involuntary muscle fibres. Fibro-cartilage was doubtfully present in one case. It is wonderful that even more confusion of tissue does not occur, seeing that from the mesoblastic somites are evolved the vertebral column, the somatic and visceral muscles, as well as the pronephros, Wolffian body and kidney, and the peritoneal endothelium.

(17) The Pathological Museum of the University of Melbourne does not contain any specimen of lymphoma of the kidney, with nodules visible by the naked eye. But the last case of the series exemplifies the microscopic growths that occur in connection with leucæmia.

(18) The common little fibromata of the pyramids have been disregarded in this paper, as well as cysts and parasites.

(19) The cases now under review have not yet been studied sufficiently, especially from the clinical side, to permit a complete division of congenital from acquired tumours. It is noteworthy that the inactive neoplasms were in many cases multiple, while the active growths were usually single. A very marked feature of the inactive tumours is the presence of many very thick-walled arterioles immediately around them. The thickening affects all the coats, but the change in the intima is sometimes very striking, the endothelial cells assuming long columnar forms. Another interesting feature of the inactive tumours is their occasional association with other forms of morbid growth. Thus the case of multiple lipo-sarcoma of the kidney was associated with sarcoma of the corresponding adrenal, and a sloughing tumour of the soft palate; the case of multiple papilliferous adenoma presented multiple cavernous angioma in the liver, and lymphomatous growths in the groins, axillæ and spleen. Among the active tumours, the case of malignant adenoma [endothelioma] was complicated with mixed-celled sarcoma of the stomach.

Bibliography.—We do not propose to cumber this paper with a lengthy bibliographical criticism. We have made as complete reference as possible with the means at our command to the published cases of primary tumour of the kidney. Many of the early records are so imperfect as to be of no service in this inquiry. Even in cases of later date the difficulties have often been avoided. A large number of the more full and accurate records fall into line at once with our own observations; and we are not aware of a single fully reported case which clashes with our main conclusions.

BURROUGHS WELLCOME & Co.
LIBRARY
No.

PRIMARY NEOPLASMS OF THE KIDNEY.

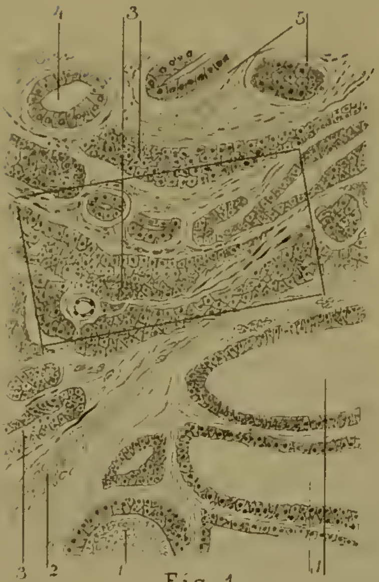


Fig. 1

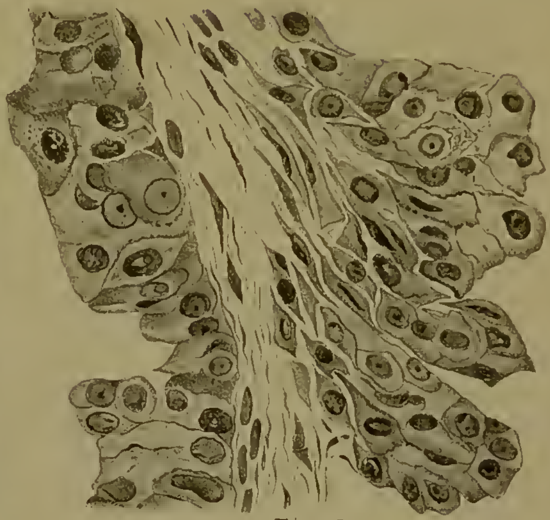


Fig. 2.

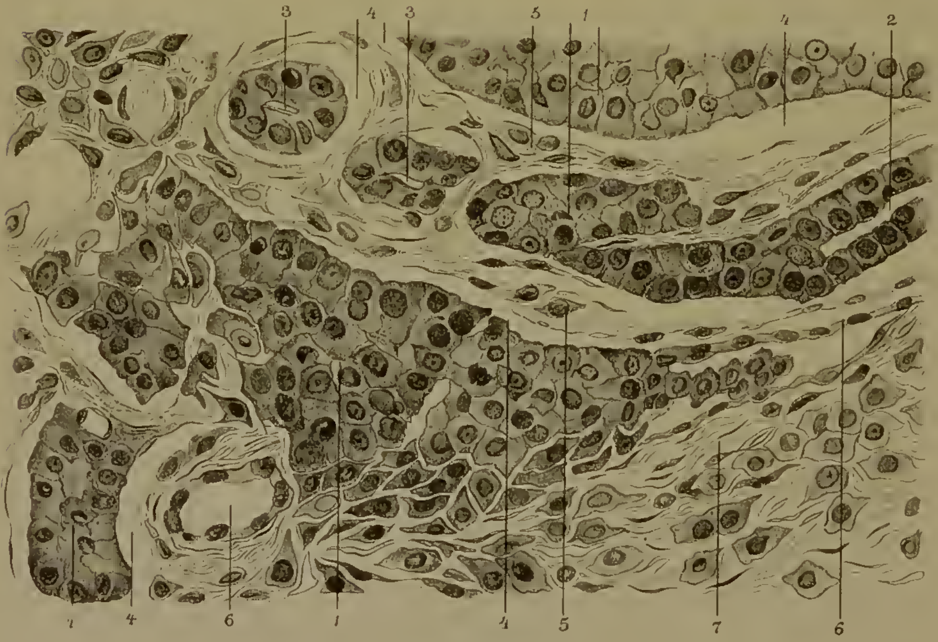


Fig. 3.

T C del   Troedel print   R Wendel lith Melb

PRIMARY NEOPLASMS IN THE KIDNEY.

DESCRIPTION OF PLATES I., II. AND III.

NOTE.—These plates are intended to demonstrate the mesoblastic character of the renal epithelium. Transitional fields have therefore been chosen for this purpose, but it must be distinctly understood that areas having the typical structure of sarcoma or adenoma may be found in all the sections. The main features of each figure and the outlines of many of the cells are drawn with the camera lucida

Fig. 1 Leitz Obj. 3, Oc. III. All the other figures Zeiss Apoch. Obj. 4mm., Compens. Oc. 4 (=252 diameters). Figs. 1, 2, 3, 4 and 6 Hæmatoxylin, Farrant's solution. Fig. 5 Borax carmine, clarified, Canada Balsam.

PLATE I

FIG. 1.—Portion of a hæmorrhagic tubular adeno-sarcoma (Case 15). To show the general relation of the growth to renal tissue, and the formation of the alveoli of the tumour from renal convoluted tubules. The structures shown in this figure merge insensibly into normal renal tubules beyond the upper limit of the plate. The rectangular portion inclosed in thin lines is shown more highly magnified in Fig. 3.

1—Cystic spaces of tumour formed by dilated tubules, many of which are filled with blood.

2—Imperfect fibroid capsule, partly invaded by the tumour, but to a large extent cutting it off from the renal tissue.

3—Renal tubules close to the capsule, taking on active growth, and appearing for the most part as solid cylinders of epithelial cells.

4—Transverse section of a tubule retaining its lumen.

5—Dilated lymph spaces surrounding most of the sections of tubules.

FIG. 2.—From the same section as Fig. 1. A portion of one of the septa separating the cystic spaces formed from dilated tubules, taken from a point a little beyond the lower edge of Fig. 1.

The central core of the septum is covered with epithelium on both sides On the left the deep boundary of this epithelium is everywhere distinct; on the right the epithelium blends with the fibrillæ of the core, and many cells may be seen in the transition stage, both cells and nuclei becoming elongate, and fine processes passing from them to blend with the fibrillæ. The core itself contains oval or elongate nuclei which stain deeply and uniformly with hæmatoxylin.

FIG. 3.—The central part of Fig. 1 more highly magnified.

1—Solid cylinders of epithelium derived from renal tubules. Along the lower margin of the large central mass many of the cells are not in close contact, the fibrillar tissue penetrating here and there between them. This margin of the epithelium is ill-defined, some of the cells being spindle shape.

2—Longitudinal section of a tubule still retaining its lumen.

3—Cross sections of tubules with active epithelium and a small lumen.

4—Dilated lymph spaces surrounding the epithelial mass.

5—Epithelioid cells lying in delicate tissue between lymph spaces.

6—Blood vessels with very active endothelium.

7—This corner of the field consists of mixed tissue, epithelioid and spindle cells lying in a fibrillar matrix.

PLATE II.

FIG. 4.—From an adeno-sarcoma (Case 16). To illustrate the formation of spindle cell tissue and fibres from renal epithelium.

1—Alveoli cut obliquely, lined with epithelial cells, many of which are spindle shape. These cells blend with those lying in the surrounding tissue.

2—Alveolus cut transversely. The deeper layer of its epithelium partly consists of spindles.

3—Epithelial cells becoming spindle shape.

4—Bands of epithelial cells showing the same transformation into spindles.

5—A large plaque splitting into spindles.

6—A spindle splitting into fibres. The remains of two nuclei are seen at one end of this cell. Notice that as the cells elongate their nuclei become paler, and the chromatin remains only in the nuclear membrane and one or two nucleoli. As fibres are formed these nucleoli alone remain visible. At 7 a line of such nucleoli indicates the origin of the fibre.

FIG. 5.—From a malignant tubular adenoma (Case 27). Illustrating the epithelioid character of many of the cells lying separate from the main mass of epithelium.

1—Tubules with proliferating and œdematous epithelium, and surrounded by dilated lymph spaces.

2—Blood vessel (?) with swollen and partially detached endothelium.

3—Pavement masses of epithelioid cells, merging into a myxomatous tissue towards the left.

4—Swollen detached epithelioid plaques.

5—Swollen granular cells lying in the fibrillar matrix (? Wander cells).

PRIMARY NEOPLASMS OF THE KIDNEY.

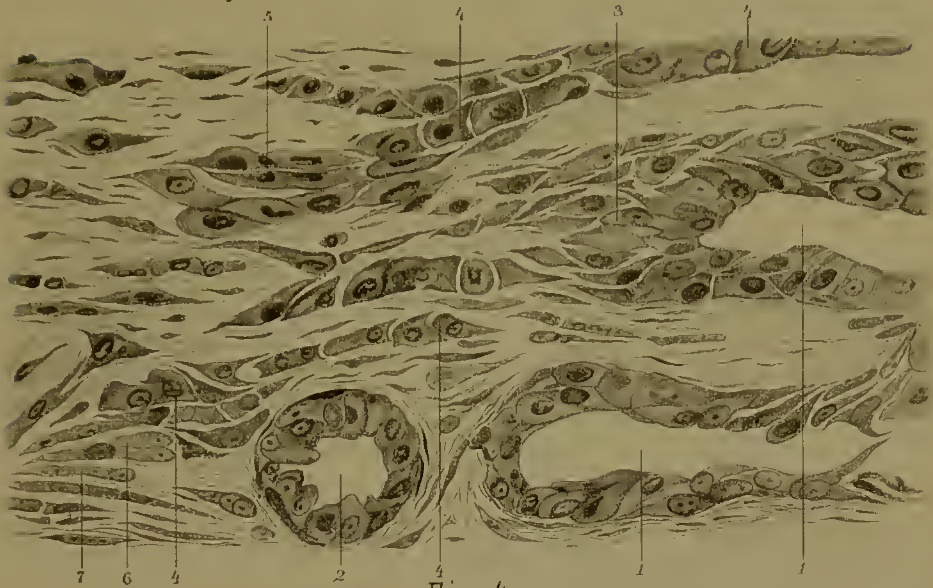


Fig. 4.

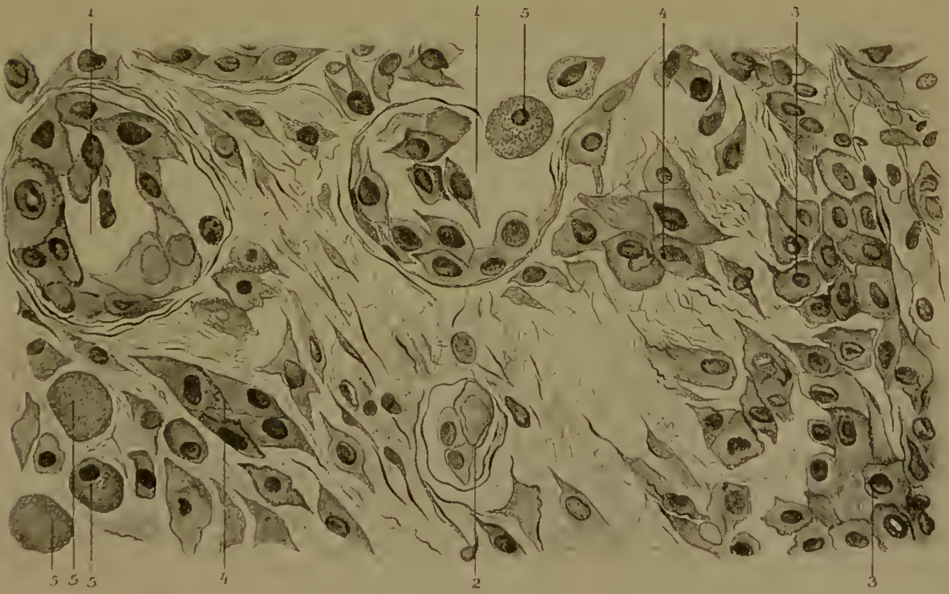


Fig. 5.

T C del   Froedel & Co print   R Wendel a.d. Nat.

Plate III

PRIMARY NEOPLASMS OF THE KIDNEY

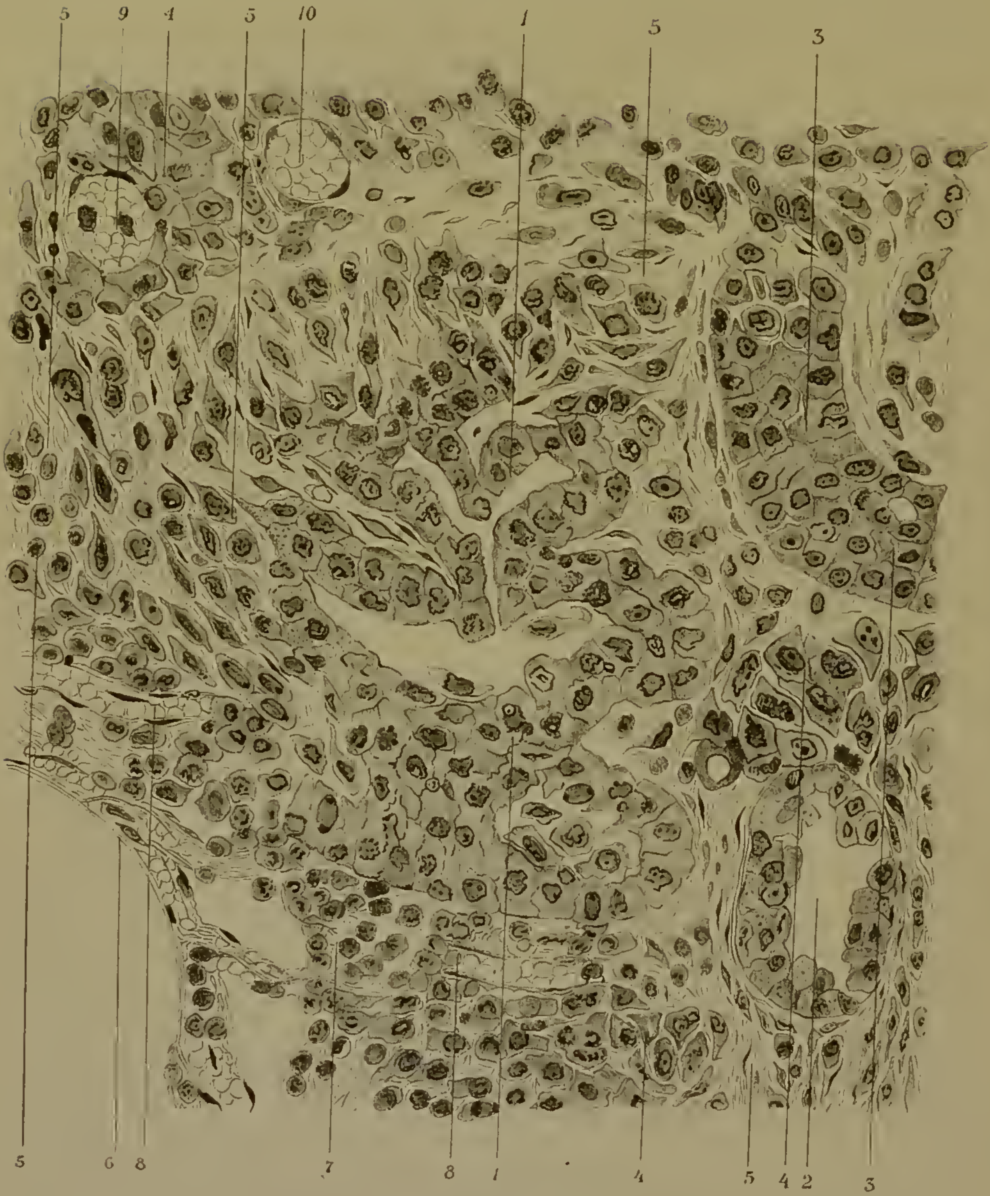


Fig. 6.

T.C. del [illegible] [illegible]

PLATE III.

FIG. 6.—Secondary tumour of the lung (Case 23). This figure illustrates the reproduction in the secondary deposits of all the features of the original renal tumour.

1—Mass of epithelium occupying the centre of the field. Papillary processes project into the small central open space. This mass of epithelium blends completely with the sarcoma tissue along its upper and left hand margins.

2—Epithelium reproducing the hollow tubules of the renal tumour.

3—Epithelium reproducing the solid cylinders of the renal tumour. These cells are separating in the upper part of this mass, and finally become indistinguishable from the surrounding sarcoma tissue.

4—Isolated masses of epithelium, the outlying cells blending with the sarcoma tissue.

5—Sarcoma tissue. The cells are mostly of large size and round or spindle shape. The intercellular substance is faintly fibrillar.

6—Wall of an air vesicle with red blood corpuscles in its capillaries. These become lost in the mass of leucocytes.

7—Leucocytes at the edge of the sarcoma.

8—Capillaries in the sarcoma tissue.

9—Small vessel embedded in a mass of epithelial cells. There is hardly a trace of endothelium present, and the epithelial cells appear in closest relation to the circulating blood.

10—Small blood vessel with nearly complete endothelium.

BURROUGHS, WELLCOME & Co.
LIBRARY
No.

WELLCOME LIBRARY

INDEX.

PAGE

Abdominal Operations at Adelaide Hospital, Statistics of—C. E. Todd 173
Acromegaly, On—R. Scot Skirving 110
Adam, G. Rothwell—Three Cases of Broad Ligament Cysts 350
Addresses of Presidents of Sections—See Presidents of Sections 59
Alcohol, The Public Health Aspect of—W. A. Chapple 291
    Discussion on 300
Allen, H. B.—The History of Twenty-nine Cases of Primary Neoplasms in the Kidney 372
Anchylostomiasis, The Treatment of—A. Jefferis Turner 101
Anderson, C. M.—Notes on a Case of Cretinism successfully treated with Thyroidin. 117
Ante-natal Adenoid Growths as a Cause of Deaf-Mutism—W. M. Stenhouse 253
Aniridia—High Hypermetropia—Compensating Partial Cataract—J. Lockhart Gibson 257
Antisepsis Temperature—Rapid Dilatation of the Os during Labour—James R. Purdy 333
    Discussion on 335
Armstrong, Hugh—Hypermetrophia a Possible Cause of Optic Nerve Atrophy 218
Ashworth, L. N.—Fifty Cases treated with Diphtheria Anti-toxin 86

Batchelor, F. C.—President's Inaugural Address 17
Barnett, L. E.—A Case of Spontaneous Shrivelling of a Cancer of the Foot 208
Barrett, James W.—The Treatment of Concomitant Convergent Strabismus 225
    The Presence of Fine Opacities in the Vitreous 229
Bowe, F.—A Case of Strangulated Hernia, complicated with Internal Obstruction 170
Brady, A. J.—Operations on the Mastoid Process in Connection with Suppurative Disease of the Middle Ear 249
Brain Operations reported at the Intercolonial Medical Congress of 1893, The Sequels of Two Cases of—George Cleghorn 218
Broad Ligament Cysts, Three Cases of—G. Rothwell Adam 350

Cancer of the Foot, A Case of Spontaneous Shrivelling of a—L. E. Barnett 208
Cancer, Short Notes of Cases of Inoperable—George Cleghorn 211
Cardiac Disease, On the Comparative Prognosis and Treatment of Different Forms of—J. Jamieson 66

PAGE

Chapple, W. A.—The Public Health Aspect of Alcohol - - - 291

Cherry, T.—The Histology of Twenty-nine Cases of Primary Neoplasms in the Kidney - - - - - - - - 372

Chronic Glaucoma—T. K. Hamilton - - - - 243

Chronic Urinary Fistulæ, Treatment, by Cystotomy and Transplantation, of—J. H. Murray-Aynsley - - - - - 198

Clamp, Exhibition of—J. H. Townend - - - - - 327

  Discussion on - - - - - - - 327

Cleghorn, George—The Sequels of Two Cases of Brain Operations reported at the Intercolonial Medical Congress of 1893 - - - - - - 218

  Small Herniæ in the Linea Alba - - - 165

  A Case of Sarcoma of the Femur - - - 213

  Short Notes of Cases of Inoperable Cancer - - 211

Closs, J. O.—Thyroidectomy in Graves's Disease. - - - 160

  Hypertrophy of the Prostate - - - - 191

Cold Bath Treatment of Typhoid Fever in Country Practice, The—H. Rabl - - - - - - - - - 78

Colour Blindness and Impaired Vision in Sailors and those Persons employed on the Railways—James Jackson - - - - 221

  Discussion on - - - - - - - 223

Colquhoun, D.—On the Diagnosis of Reichmann's Disease and Some Other Stomach Conditions - - - - - - 104

Concomitant Convergent Strabismus, The Treatment of—James W. Barrett - - - - - - - - - 225

  Discussion on - - - - - - - - 228

Contagious Diseases Act - - - - - - - 3

Cretinism successfully treated with Thyroidin, Notes on a Case of—C. M Anderson - - - - - - - - - 117

Death Certification and Registration in New South Wales—G. L. Mullins 314

De Lautour, Harry A.—A Simple but Effective Apparatus for the Treatment of Dislocation of the Acromial End of the Clavicle, Upwards and Backwards - - - - - - - - 214

  On the Question of Finger Marks and Footprints in Medico-Legal Investigation - 317

  A Case of Nephrolithotomy — Removal of Twenty-six Calculi - - - - 210

Dental Section, A - - - - - - - - 3

Dermoid Cyst Coincident with Pregnancy, Case of—Robert Scott - 352

  Discussion on - - - - - - - - 354

Diabetes Mellitus—Cancer of Pancreas: Protozoa of Cancer, An Interesting Case of—Gregory Sprott - - - - - 73

Diphtheria Anti-toxin, Fifty Cases treated with—A. J. Turner and L. N. Ashworth - - - - - - - - 86

  Discussion on - - - - - - - - 92

Dislocation of the Acromial End of the Clavicle, Upwards and Backwards, A Simple but Effective Apparatus for the Treatment of—Harry A. de Lautour - - - - - - - 214

Dyring, C. P. W.—Treatment of Spasmodic Laryngitis or Croup - 84

PAGE

Educational Problems affecting Health—W. M. Stenhouse 304
Episcleritis, The Ætiology of—W. M. Stenhouse 251
Examination of a Potable Water from a Bacteriological and Chemical Point of View—A. G. Kidston-Hunter 285
Examination of the Nares in the Routine Investigation of Various Local and General Diseases—W. G. Scott 259
Executive Committee, Report of 2

Fæcal Fistula treated by Resection with Murphy's Button, Case of—J. H. Townend 167
Ferguson, H. Lindo—Mania after Extraction of Cataract 256
Fine Opacities in the Vitreous, The Presence of—James W. Barrett and P. S. Webster 229
Finger Marks and Footprints in Medico-Legal Investigation, On the Question of—Harry A. de Lautour 317
Forward Dislocation of Lens—Traumatic Myopia—Retention of Accommodation—J. Lockhart Gibson 258

Gall Stone, passed during Life, with Specimen, A Few Notes upon an Unusually Large—A. Martin 144
Garland, A. J.—Puerperal Fever 328
Gibson, J. Lockhart—Aniridia—High Hypermetrophia—Compensating Partial Cataract 257
  Forward Dislocation of Lens—Traumatic Myopia—Retention of Accommodation 258
  Progress Report of a Myxœdematous Sporadic Cretin 116
  Some General Medical Aspects of Nasal Obstruction 93

Haines, C. H.—Section of Spermatic Cords for Hypertrophy of Prostate 189
Hamilton, T. K.—Chronic Glaucoma 243
  Rhinitis Chronica Atrophicans Fœtida 231
Hygiene, Resolutions concerning 55
Hypermetropia a Possible Cause of Optic Nerve Atrophy—Hugh Armstrong 218
  Discussion on 221
Hypertrophy of the Prostate—J. O. Closs 191
  Discussion on 197
Hughes, W. Kent—A New Kind of Talipes. 216

Inaugural Meeting 1
Innervation of the *Musculus Sternalis*, with Remarks on its Morphology, Notes on the—J. T. Wilson 358
Insanity from Association—H. C. McDonall 307
Intercolonial Medical Journal 3

Jackson, James—Colour Blindness and Impaired Vision in Sailors and those Persons employed on the Railways 221
Jamieson, J.—On the Comparative Prognosis and Treatment of Different Forms of Cardiac Disease 66

PAGE

Kidston-Hunter, A. G.—Examination of a Potable Water from a Bacteriological and Chemical Point of View - - - - - 285

Lead-Poisoning from Tea Drinking, An Unusual Case of Acute—G. L. Mullins - - - - - - - - - 119
Lendon, A. A.—Address in Section of Medicine - - - - 59
Leucoderma, On a Case of Complete—Mr. Pulleine - - - 147
Lewis, T. Hope—The Thermal Springs of New Zealand - - - 120
Love, Wilton—Notes on Puerperal Eclampsia, with Special Reference to Urea Excretion - - - - - - - 336

Mania after Extraction of Cataract—H. Lindo Ferguson - - 256
Martin, A.—A Few Notes upon an Unusually Large Gall Stone, passed during Life, with Specimen - - - - 144
  Partial Thyroidectomy - - - - - . 158
Mason, J.—Some Old Truths about Rural Sanitation - - - 276
Mayor's Luncheon, The - - - - - - - - 6
McDonall, H. C.—Insanity from Association - - - - 307
Mullins, G. L.—An Unusual Case of Acute Lead-Poisoning from Tea Drinking - - - - - - 119
  Death Certification and Registration in New South Wales - - - - - - 314
Murdoch, James—Note on a Novel Method of Treating Tuberculosis of the Lungs - - - - - - - 145
Murray-Aynsley, J. H.—Treatment of Chronic Urinary Fistulæ by Cystotomy and Transplantation - - - - - 198
Myxœdematous Sporadic Cretin, Progress Report of a—J. Lockhart Gibson - - - - - - - - - 116

Nasal Obstruction, Some General Medical Aspects of—J. Lockhart Gibson - - - - - - - - - 93
Nash, J. B.—Four Cases of Renal Calculus: The Effects on Surrounding Tissues and their Treatment by Operation - - - - 201
Nephrolithotomy—Removal of Twenty-six Calculi, A Case of—Harry A. de Lautour - - - - - - - - 210
Noyes, A. W. Finch—Tuberculosis of the Skin and Cutaneous Manifestations occurring in Scrofulous Subjects - - - - 135

O'Hara, Henry—Address in Section of Surgery - - - - 149
Olfactory Centre, Notes on the—G. Elliot Smith - - - - 366
Opening Ceremony - - - - - - - - 13

Pharyngo-Mycosis Leptothricia, A Case of—C. Purser and F. Tidswell - 97
Philosophy of Disease: A Study in Pathogenesis, The—M. Lomax Smith 124
President's Address, The—F. C. Batchelor - - - - 17
Presidents of Sections, Addresses of—
  Medicine—A. A. Lendon - - - - - - - 59
  Surgery—Henry O'Hara - - - - - - - 149
  Public Health—J. W. Springthorpe - - - - 267
  Midwifery and Diseases of Women—E. W. Way - - 319
  Anatomy, Physiology, Pathology and Pharmacology—A. Watson 356

PAGE

Primary Neoplasms in the Kidney, The Histology of Twenty-nine Cases of—H. B. Allen and T. Cherry 372

Pterygium—A. C. Purchas 248

Puerperal Eclampsia, with Special Reference to Urea Excretion, Notes on—Wilton Love 336

Discussion on 341

Puerperal Fever—A. J. Garland 328

Discussion on 329

Pulleine, Mr.—On a Case of Complete Leucoderma 147

Purchas, A. C.—Pterygium 248

Purdy, James R.—Antisepsis Temperature—Rapid Dilatation of the Os during Labour 333

Purser, C.—A Case of Pharyngo-Mycosis Leptothricia 97

Rabl, H.—The Cold Bath Treatment of Typhoid Fever in Country Practice 78

Reichmann's Disease and Some Other Stomach Conditions, On the Diagnosis of—D. Colquhoun 104

Renal Calculus: The Effects on Surrounding Tissues, and their Treatment by Operation, Four Cases of—J. B. Nash 201

Report of Executive Committee 2

Retro-Displacements of the Uterus, Treatment of—Ralph Worrall 343

Discussion on 348

Rhinitis Chronica Atrophicans Fœtida—T. K. Hamilton 231

Discussion on 242

Rural Sanitation, Some Old Truths about—James Mason 276

Sarcoma of the Femur, A Case of—George Cleghorn 213

Scott, Robert—Case of Dermoid Cyst Coincident with Pregnancy 352

Scott, W. G.—Examination of the Nares in the Routine Investigation of Various Local and General Diseases 259

Section of Spermatic Cords for Hypertrophy of Prostate—C. H. Haines 189

Small Herniæ in the Linea Alba—George Cleghorn 165

Skirving, R. Scot—On Acromegaly 110

Smith, G. Elliot—Notes on the Olfactory Centre 366

Smith, M. Lomax—The Philosophy of Disease: A Study in Pathogenesis 124

Spasmodic Laryngitis or Croup, Treatment of—C. P. W. Dyring 84

Discussion on 85

Springthorpe, J. W.—Address in Section of Public Health 267

Sprott, Gregory—An Interesting Case of Diabetes Mellitus—Cancer of Pancreas: Protozoa of Cancer 73

Stenhouse, W. M.—Ante-natal Adenoid Growths as a Cause of Deaf-Mutism 253

Educational Problems affecting Health 304

The Ætiology of Episclerites 251

Stephanion, and on Various Descriptions of the Temporal Lines of the Skull, Notes on the—J. T. Wilson 362

PAGE

Strangulated Hernia, complicated with Internal Obstruction, A Case of—F. Bowe - - - - - - - - 170
Suppurative Disease of the Middle Ear, Operations on the Mastoid Process in Connection with—A. J. Brady - - - - - 249

Talipes, A New Kind of—W. Kent Hughes - - - - 216
Thanks, Votes of - - - - - - - - 57
Thermal Springs of New Zealand, The—T. Hope Lewis - - - 120
Throidectomy, Partial—A. Martin - - - - - 158
Throidectomy in Grave's Disease—J. O. Closs - - - - 160
 Discussion on - - - - - - - 165
Tidswell, F.—A Case of Pharyngo-Mycosis Leptothricia - - - 97
Todd, C. E.—Statistics of Abdominal Operations at Adelaide Hospital - 173
Townend, J. H.—Case of Fæcal Fistula treated by Resection with Murphy's Button - - - - - - - 167
Tuberculosis, Medical Aspect of - - - - - - 36
 General Discussion on - - - - - - 46
Tuberculosis, Resolutions concerning - - - - - 52
Tuberculosis of the Skin and Cutaneous Manifestations occurring in Scrofulous Subjects—A. W. Finch Noyes - - - - 135
Tuberculosis of the Lungs, Brief Note on a Novel Method of Treating—James Murdoch - - - - - - - 145
Turner, A. Jefferis—The Treatment of Anchylostomiasis - - 101
 Fifty Cases treated with Diphtheria Anti-toxin - 86

Vision, Testing the - - - - - - - - 56

Watson, A.—Address in Section of Anatomy, Physiology, Pathology and Pharmacology - - - - - - - 356
Way, E. W.—Address in Section of Midwifery and Diseases of Women 319
Webster, P. S.—The Presence of Fine Opacities in the Vitreous - 229
Worrall, Ralph—Treatment of Retro-Displacements of the Uterus - 343
Wilson, J. T.—Notes on the Innervation of the *Musculus Sternalis*, with Remarks on its Morphology - - - - 358
 Notes on the Stephanion and on Various Descriptions of the Temporal Lines of the Skull - - - 362